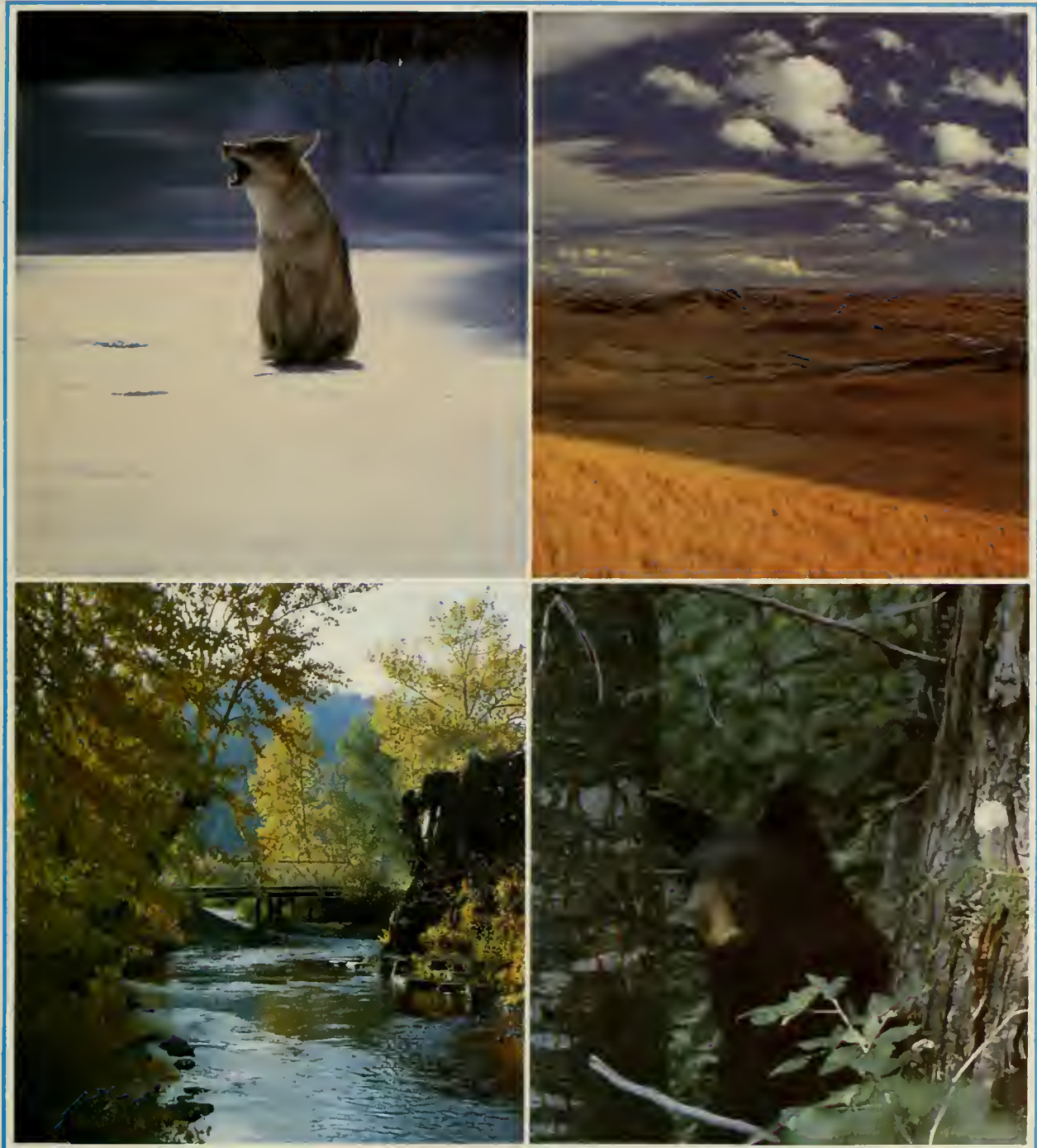


MONTANA OUTDOORS

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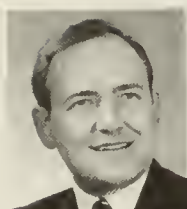


montana's many faces

MONTANA OUTDOORS

the official publication of the
Montana Department of Fish and Game
November/December 1973, Vol. 4, No. 6

state of montana



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the cover

Turn to page 39 for more of Montana's many faces. Photo credits: fall and prairie scenes—Gus Wolfe, coyote—Rolph Williams and black bear—Otis Robbins. Back cover photo of the burrowing owl—courtesy of the Texas Parks and Wildlife Department.

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a livable environment for WILDLIFE is a quality environment for MAN

We're already deep into the 1973 hunting season. Hopefully, you've already noticed that the department is trying something new this year.

The Fish and Game Commission asked the department to field as many personnel as possible this year—and preferably in marked vehicles. The commissioners are worried that a possible increase in hunting pressure coupled with several new laws passed by the last legislature would raise more than the usual amount of questions.

The commissioners hope fewer problems and violations will occur by having department personnel in the field in a readily identifiable manner. The commissioners were most concerned about two laws:

- *checking stations*—previously, checking station stops by hunters were voluntary. But now the new legislation makes the stops mandatory if the checking station is on the route to or from the hunting area.

- *off road vehicles*—it is now unlawful to take vehicles off established roads except to retrieve downed game.

Although certainly not “new,” the commissioners also voiced some concern about landowner permission. As in past years, hunters must obtain permission from the private landowner to hunt his land.

So if you have a question on some specific part of hunting rules, regulations or new legislative action, don't hesitate to ask any department person you find. That's why they're there. 🐾

Wes Woodgerd, Director
Department of Fish and Game



MONTANA OWLS

the silent ones

by Craig Sharpe

EONS AGO, ONE of the most fierce birds ever to live appeared on the earth. Through the years, this bird of prey received more unjust criticism than any other raptor. The Bible speaks of the bird as unclean and one that "shall not be eaten." Witches supposedly used it as a secret ingredient in the "bubbling brew."

This bird has been called "devil," "terror of the night," a "witch with wings" and the "bird of death." And poets and writers knew it as a "messenger of death" or a "bad omen."

What caused this unjust criticism of the owl? Perhaps it's the owl's home range. In general, owls avoid mankind and civilization. Usually, owls inhabit forests, cliffs, marshes and old ruins—or even graveyards. Maybe this is why man associates it with death. The ancient Arabs even believed the owl represented human souls.

Another factor that can't be ignored in assessing the owl's reputation relates to its eating habits. The owl is a killer, an opportunist, a predator. Its prey varies with the terrain, climate and species of owl doing the hunting. The owl may take mice, voles, lemmings, moles, shrews, gophers, squirrels, birds, rats, frogs, spiders, crawfish, hares, toads, grasshoppers, beetles, crickets, insects,

continued

The great gray owl (above), one of Montana's rarest owls, and the great horned owl (below), one of the most common. Both photos by Jon Cates

A fledgling great horned owl "on guard" shortly after leaving the security of the nest. Photo by Gus Wolfe



"Lizard's leg, and howlet's wing,
For a charm of powerful trouble,
Like a hell-broth boil and bubble."

—William Shakespeare, *Macbeth*

chipmunks, skunks, fish, ducks and other waterfowl, domestic fowl, rabbits and even an occasional domestic cat.

Eating etiquette isn't a part of the owl's life style and this might explain its affiliation with uncleanness. The owl sits on one of its regular perches and literally tears its victim to pieces (except when the prey is small enough to be swallowed whole). After the prey is swallowed, indigestibles (i.e. bones, feathers, etc.) are later regurgitated in the form of pellets.

Man has always feared darkness. This, in turn, may explain fear of the owl, since

many species are nocturnal (active only at night). In Montana, approximately 8 of 14 recognized species are nocturnal or crepuscular (active early morning and/or late evening). Walking down a quiet road and having the "bird of death" swoop down in front of you can be an unforgettable, spine-chilling experience.

Because of the owl's ability to maneuver at night, man believed the owl could see in total darkness. This myth was passed down from age to age. The owl's eyes, although between 35 and 100 times more acute than man's, are not the bird's only strength in darkness. The owl combines its

superb eyesight with acute hearing and soundless flight. In general, the owl's ears, located behind its facial disc (or parabolic dish) are proportionately larger than those of any other bird. With these discs located around the eyes, all sound may be funneled to the eardrum.

With its eyes and ears attuned to its prey, the owl takes to its large, soft wings. The wings are large—for a slow, drifting flight—and the feathers are soft for quietness. Once airborne, the owl homes in on its victim, headfirst. When the distance narrows between owl and prey, the feet (with large talons) come forward. As the talons strike, they spread for wider coverage and allow for any slight navigational error.

In spite of the owl's role as a winged hunter, people kill it through ignorance of its value or from idle curiosity. To fully understand the owl's value, one must first understand the biological scheme. Both prey and predators exist. Predators are less numerous than the animals upon which they feed, yet the number of prey species regulates the number of predators. This, in essence, amounts to natural control of the predator population.

The owl helps regulate rodents and insects. Without it and other natural controls, rodent and insect populations might reach epidemic proportions. Crops literally could be chewed to the ground. Disease might spread, and the biological scheme could be seriously disrupted.

In years of famine, owls

MONTANA OWLS

Classification:

Kingdom—Animal

Phylum—Chordata

Class—Aves

Order—Strigiformes

Family—Strigidae (all except Barn Owl)

Tytonidae (Barn Owl)

KEY: (*-Only a few state records, B-breeding records established, W-regular wintering bird.)

Species	Recorded sightings	Habitat
Barn Owl	* (in the last 50 years)	woodlands, old buildings, farms
Screech Owl	BW	woodlands, wooded canyons, farm groves
Great Horned Owl	BW	forests, thickets, streamsides, canyons, open country
Snowy Owl	W	prairies, tundra, fields, marshes
Hawk Owl	*	conifer forests
Pygmy Owl	BW	wooded canyons, mixed forests
Burrowing Owl	B	prairies, deserts, grasslands
Barred Owl	*	woodlands, drainages
Spotted Owl	*	heavy forests, wooded canyons
Great Gray Owl	BW	heavy forests, forest meadow areas
Long Eared Owl	BW	willow thickets, mt. forest edge areas
Short Eared Owl	BW	prairies, marshes, irrigated lands
Boreal Owl	* (occasionally winters in Montana)	mixed conifer forest
Saw-whet Owl	BW	forests, wooded canyons, conifers, groves

ABOUT THE AUTHOR



Craig Sharpe is an audio-visual technician for the department's film center. He received a bachelor of science degree in motion picture production from Montana State University, Bozeman, and previously worked as a photographer and printer for a portrait studio.

The pygmy owl, Montana's smallest. Photo by Louis Moos. The short eared owl (below) is usually found on, or near, the ground. Photo by Gus Wolfe

disperse in search of food. These years may be called "wanderjahren." In Montana, sightings of snowy owls in approximately seven-year cycles is an example of "wanderjahren." Normally, snowy owls reside in Canada and the arctic where they prefer prairie habitat. Their appearance in Montana indicates that the number of small rodents (their food supply) in their usual habitat is low.

Owls practice a unique method of birth control. In years when prey numbers are low, owls may lay one, two and sometimes no eggs. (The normal birth rate is three to five eggs.) Reproduction among owls requires cooperation and coordination. Clumsy mating or interruption may produce infertile eggs or no eggs at all. Disturbances such as logging, mining, subdividing and road building not only destroy habitat, but may seriously hamper reproduction efforts.

Since the end of World War II, the number of all birds of prey has seriously declined. In 1971, the Montana Legislature passed a law protecting birds of prey, including the owl. It is now illegal to hunt, kill, capture, possess, purchase, offer or expose for sale, transport or cause to be transported any raptor in the state of Montana. Exceptions exist only under provisions of the falconer's permit or Department of Fish and Game approval. (Falconers' permits are available through the department.) Montana is not the first state to enact legislation of this kind. In fact, first protection of the owl came from New Jersey in 1850.

We in Montana have finally realized the owl's importance. The bird is not a "bad omen," not a "witch with wings," not a "bird of death," but an aesthetically and biologically important wildlife species. 



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We have only a limited supply

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Use the handy, tear-out card to order your calendar and subscription(s). By ordering today, you can avoid the Christmas rush and get your calendar earlier.

NATURAL RESOURCES DESERVE A BREAK

America's fast food establishments squander forest products and use a huge amount of energy. That's what a University of Illinois engineering professor discovered.

McDonald's alone uses the equivalent of a sustained yield of 315 square miles of forest for its paper products in one year. Its approximately 1,750 outlets used the energy equivalent of 12.7 million tons of coal. That's enough coal to supply the combined power needs of Pittsburgh, Boston, Washington and San Francisco for a year.

Just think of the paper cups, boxes, wrapping papers, napkins, sacks and straws that are tossed away after a visit to McDonald's, Colonel Sanders, Dairy Queen or any other of the speedy eateries. It's at least symbolic of the nationwide waste of resources and the ever increasing amount of solid waste.

The professor, Bruce Hanon, made another thought provoking point: the energy content of an item from McDonald's is about one-tenth the energy expended in getting it from the farm to the consumer.

SIPPERS AND GUZZLERS

Gas shortages, rising gas prices and an unusually large amount of advertising from Detroit are confusing many potential buyers of 1974 cars.

Future selection of a car may be easier because the Environmental Protection Agency has reported the gas mileage performance of every 1973 car sold in the United States. Generally, big cars—both foreign and domestic—gobble about twice as much gasoline as smaller models.

The 364 individual vehicles were tested over a 7.3-mile urban trip, including the usual stops, starts, idling at stop lights and steady cruising of average city driving conditions.

Datsun's 2,000-lb. model



had the best fuel record at almost 28 miles per gallon. Toyota, in the same weight class, was close behind with 26 mpg.

Other models getting over 20 mpg included (in declining order): Honda, Triumph Spitfire, Fiat Sport Spider, Buick Opel, Mazda, Volkswagen Beetle, Plymouth Cricket, Dodge Colt, Saab 97, Ford Capri, Vega and Pinto.

At the opposite end of test results, the Ferrari Spyder gulped 6.3 mpg. In ascending order, up to about 10 miles a gallon were: the Chevrolet Suburban, Ford Wagon, Lincoln-Mercury Station Wagon, Plymouth Satellite, Pontiac Catalina, Rolls Royce, Cadillac, Buick Electra, Lincoln, Oldsmobile Toronado, Imperial, Chrysler and AMC Ambassador Wagon.

One recent EPA report showed about 12-1/2 per cent of all energy consumed in the U.S. is burned by automobiles. Perhaps legislative and consumer pressure is necessary to push the nation's automobile manufacturers toward smaller cars with more efficient fuel consumption.

CAMPING IN COMFORT?

Washington Watch, newsletter of the National Wildlife Federation, reports yet another "development" on the camping scene.

A group of developers—Hi-Rise Campsites, Inc.—plans a 20-story campground in the middle of downtown New Orleans. Eight lower floors will be set aside for parking. The 12 upper floors will have individual sites equipped with utility hookups for campers and carpeted with artificial turf. A rooftop pool will crown the effort.

One can't help but wonder if each lounge chair will have a built-in sun lamp attachment.

A spokesman for the developers said, "It is designed for today's different brand of camping. People don't want the woodsy bit now; they want to camp in comfort near the city." Give me the good old days!

CONSERVATION PAPER SAVED BY DONATIONS

There's an often used phrase that goes something like, "conservation is more than conversation." Ecology-minded people across the country proved they were willing to do more than talk, and about \$31,000 was sent in to keep the *High Country News* afloat.

The paper, a biweekly published in Lander, Wyo., carries a few news items on camping and national parks. But, it primarily covers environmental and conservation issues affecting the Rocky Mountain area. Editor Tom Bell has delved into strip mining, clearcutting, irrigation practices and water pollution, according to a recent article in EDITOR & PUBLISHER.

The contributions prove that people are concerned enough about ecology to give where it hurts the most—from the pocketbook. The paper proves that hard-hitting editorial stands may do some good. For example, funds for a large dam and reservoir in Utah (to provide water for irrigation in Wyoming) were withheld and the Wyoming law on strip mining was upgraded. Bell thinks *High Country News* may have had something to do with both actions.

smokey bear is not everyone's hero

The real Smokey Bear was born in New Mexico in 1950. He lived a carefree life until the day of the fire. Someone had been careless with matches and a wildfire resulted.

After the fire, Smokey was found clinging with burnt paws to a charred tree trunk, too scared to move—truly a pitiful sight, they say. Then, the little black bear cub became “Smokey” and was nursed back to good health. At the same time—and unknown to our little bear—he became the national symbol for a “prevent forest fires” campaign.

(This is, at least, how the story goes in the child's book—“The True Story of Smokey Bear”—put out by the U.S. Forest Service and an advertising agency.)

Now, Smokey is probably the nation's most famous bear. Only Goldilock's friends dare challenge his popularity. You've heard his slogans—“Remember, only you can prevent forest fires.” Or, “Remember Smokey's friends. Don't play with matches.” Or, “Remember, there are babes in the woods!” All this comes to the public in mountains of literature—coloring books, songs, posters, brochures—you name it.

What has come of this massive effort to sell Smokey's philosophy on forest fires? In general, Americans now believe all forest fires are tragedies to be avoided at any cost. Smokey Bear is their hero. Taking a milder approach, however, we believe the campaign has been *oversold*. All forest fires are not *all* bad. Smokey is not always a “hero.”

It took many years, but now game workers are finally beginning to see through Smokey's “smoke screen.” And they don't really like what they see—disappearing big game herds.

New Mexico, Smokey's home state, was probably one of the first to “knock the sacred cow” (or bear, in this case). In March 1970, the New Mexico Department of Game and Fish refuted Smokey in a rather pointed editorial, “Bare Facts About a Bear Story.”

“There is much good to be said about his [Smokey's] teachings,” wrote Game and Fish Department Director Ladd Gordon in NEW MEXICO WILDLIFE (MO's counterpart in New Mexico). “We feel, however, that he has overplayed his part....Smokey Bear is not necessarily synonymous with all that is good in conservation.”

Gordon went on to spell out the detrimental effect modern fire protection technology has had on game populations in his state. “Our game populations can no longer afford the luxury of almost total protection from fire,” was his alarming conclusion.

Many other states have drawn similar conclusions from big game research projects. The Nov./Dec. 1971 issue of MO contained a detailed account of the effect of fire on wildlife. Since then, the topic has been aired many times by department personnel.

In that article, author Reuel Janson warned that plant succession was slowly eliminating many prime big game ranges created by wildfires in the early 1900s. And along with the disappearing habitat, Montana's famous deer and elk populations were decreasing.

Deer and elk fare well in the early stages of plant succession—low-growing brush, for the most part. However, as the forest matures and taller evergreens take over, the forest loses much of its value to big game.

Janson explained how controlled or prescribed burning can, in some cases, create winter range for deer and elk without harming other forest values. Experiments along that line since have met some success.

However, he also noted that vast acreages in Montana—officially designated wildernesses—were off-limits to controlled burning.

The Wilderness Act of 1964 doesn't allow “artificial” actions of man in areas included under the provisos of the law. It guarantees the wild lands will remain in their “natural, untrammelled” state.

Consider Montana's vast Bob Marshall Wilderness, for example. Here, man has *artificially controlled natural* forest fires for more than 25 years.

At this writing, there have been 27 fires in the Bob Marshall this year. Only two were man-caused. But *every one was quickly squelched by FS personnel or professional smokejumpers.* (The largest was eight acres.)

WILDFIRES AND WILDLIFE

Upon hearing of this series of successful fire suppressions, most people would be quick with pats on the back for the fire controllers. Some might even carry on about how much wildlife was "saved" by such proficiency.

As far as deer and elk are concerned, however, the effects of such suppressions go unheralded. The Bob Marshall, and especially the Sun River Game Preserve, needs new big game habitat in the worst way. The net effect of widespread wildfires would be beneficial, not detrimental, to wildlife.

To make this situation even worse, the Sun River Game Preserve (SRGP)—the eastern one-third of the Bob Marshall and the northern edge of the Scapegoat Wilderness—had five fires. Four were natural, lightning-caused. *But all five were held to one-tenth acre or less.*

The SRGP, where no hunting is allowed, already has more elk than it can continue to support. The limited game range is already overused. And, die-offs of elk and bighorn sheep

have already occurred. Or, in other words, the SRGP needs more big game habitat. It needs it now. And these lightning-caused fires might have created it.

About now some readers are probably saying, "Okay, but what about all the wildlife the fires would burn up?"

Unfortunately, no factual evidence exists about the initial loss of wildlife from wildfire. But, we feel popular estimates are grossly exaggerated.

First off, large animals—elk, bear, etc.—are physically capable of avoiding all but the wildest wildfires (and they may avoid those, too). In smaller fires, the loss of large animals must be zero, in our opinion.

Smaller wildlife, on the other hand, probably isn't so fortunate. Spring fires certainly destroy some nests and smaller animals too young to travel easily. Fall fires also may result in some loss of small wildlife—mice, squirrels, etc. However, most fires occur in late summer and fall when danger to wildlife is lowest.

And another point—fire-caused wildlife losses are *part of natural mortality, not in addition to it.* It's been this way for a long, long time. Wildlife has an uncanny knack of "bouncing back" after fires.

ECONOMICS AND WILDLIFE

Setting wildlife aside for a moment, consider the economics of modern fire technology. This past fire season the U.S. Forest

continued

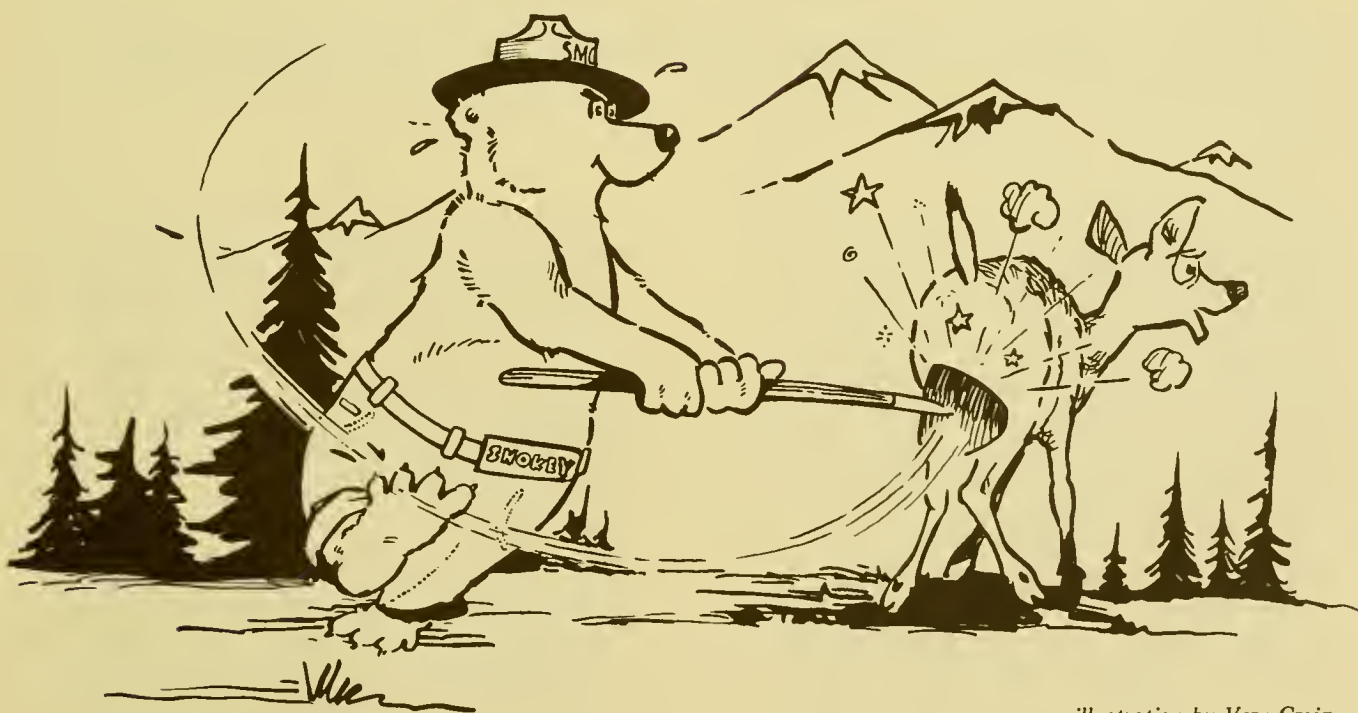


illustration by Vern Craig

Service's Northern Region (Montana, northern Idaho, eastern Washington and parts of the Dakotas) had about 1,500 fires, one-third of which were lightning-caused. But fire fighters kept the Northern Region blazes to under 29,000 acres—an average of less than two acres per fire. In Montana alone, all private and public interests spent more than \$15,000,000 to control fires.

Meanwhile, the FS budgeted \$870,000 for wildlife-related programs in 1973. These programs are meant to improve habitat and increase wildlife numbers.

Obviously, Montana could have much more prime wildlife habitat at *very little cost to anyone*—even the lumber industry. In fact, the public would have saved thousands of dollars and had more wildlife to enjoy. How? By simply letting a few wildfires go in wild areas such as the Bob Marshall, the Selway-Bitterroot and the Scapegoat wildernesses.

GOING IN THE RIGHT DIRECTION—TOO SLOWLY

We don't want readers to interpret this editorial as a broadside on the FS, other agencies or any part of the fire suppression program. We simply wish to crack Smokey's "all forest fires are bad" philosophy.

And we don't want anyone to shoot down Smokey. The bear still has a very valid function in preventing man-caused fires in areas where they "won't do any good."

We believe the correct course has been chosen by all concerned. However, we also believe progress is moving too slowly.

The federal agencies agree the day will come when some fires will be allowed to burn. However, they don't like the phrase, "let it burn."

One FS official told MO that, "The day will certainly come when we let some fires go in areas like the Bob Marshall." However, he could not say when.

The FS has established the White Cap study area in the Selway-Bitterroot Wilderness in an attempt to document the natural role of forest fires. In this special area—and in similar projects established by other federal agencies—lightning-caused fires are allowed to burn.

Right now, researchers are busy finding that little is known about this relatively new practice of using fire in forest management. We completely agree with these research efforts, but there's one part of the "burning" issue that seems to be sidelined—the wilderness concept. In these wild areas, everything is supposed to happen "naturally" without any influence by man. And, lightning-caused forest fires have been a part of nature's plan for centuries. These are *natural* fires—part of any wilderness until the past few decades when modern fire technology has kept them to a minimum.

So, we cautiously say some (perhaps just a few) lightning-caused fires are consistent with the philosophy of the Wilderness Act and should be allowed to travel wherever they wish within the wilderness boundaries.

The end result will be more wildlife, more money left in public coffers and more recreational opportunities for Montanans.—*Bill Schneider* 

a natural areas system for montana?

guest editorial by Rick Applegate and Dorothy Bradley

Montana has a source of wealth and enjoyment—as well as an immense responsibility—in the form of about five million acres of trust lands. These lands were granted by the federal government under the Enabling Act which provided for Montana statehood. At that time, income from these so-called "school" lands (usually sections 16 and 36 of each township) and other land was reserved for support of public schools and other institutions. Unlike most states, Montana has retained almost 88 per cent of this original grant. These lands are administered by the State Board of Land Commissioners.

The Enabling Act sets aside income from trust lands for support of schools. So, the State Board of Land Commissioners (which has administrative authority on these lands) has, to a

certain extent, promoted land uses which bring the highest monetary return to the state's interest and income fund. However, growing sentiment exists in the state that some of these lands have natural, scenic and recreational values. And these same people feel a form of protection is needed. In other words, some Montanans feel that maximizing monetary returns from these lands is a lower priority than protecting them, in certain cases.

A number of identified tracts appear to have natural area potential, although no systematic inventory has been compiled. For example, a 320-acre parcel in central Montana has no current right-of-way or vehicle access. The river flowing through it has deep fishing and swimming pools. The tract contains a scenic gorge, a small forest, cliffs, rock outcrops, fire

rings and exceptional scenic views. Another tract in southeastern Montana contains steep, rugged badlands, and no vehicular access or right-of-way.

The land board has, on occasion, set a precedent for land use alternatives. Instead of simply fostering a use which brings the greatest financial return, it designated state lands for recreational use when it appeared that greater public benefit would result. Indeed, the legislature, in defining statutory duties of the land board, has stated that "...the guiding role and principle shall be that these lands and funds are held in trust for the support of education *and for the attainment of other worthy objects helpful to the well-being of the people of the state,*" [emphasis supplied]. Recreational use of the land and protection of inherent natural ecosystems for future generations are clearly examples of "worthy objects helpful to the well-being of the people of the state."

Therefore, it is not out of order that the state should seriously consider a statute which makes natural area preservation official state policy. Such a system is distinct from the state park system. The natural areas system would emphasize natural values and protect them over other uses—including recreation—should a conflict develop. Any system of protection seems timely in view of increasing development with which Montana is faced, (i.e., burgeoning second home and recreation developments, motorized overland winter and summer vehicles, and strip mining with its accompanying land demands—aqueducts, transmission and railway lines). Although unspoiled land seems plentiful today, its disappearance is virtually assured if it is assumed the land will automatically be unspoiled forever. An orderly system for preserving these lands is the only alternative to sheer chance in assuring that some state lands will have the integrity of a natural ecosystem intact for the future.

Federal policy has long recognized the need for such a preservation system. It is perhaps fitting that a decade of the far-reaching national Wilderness Act of 1964 be commemorated with enactment of a natural area preservation system for Montana.

The legislation, HB 628 (the Montana Natural Areas Act of 1974) will be voted upon by the 1974 legislature. Our intent is to publicize and discuss it early in order to incorporate criticism and suggestions by the time the legislature convenes.

In HB 628, a natural area is defined as an area primarily affected by the forces of nature, where human intrusion is not a dominant feature; where there are opportunities for solitude or primitive, unconfined recreation; or where there are unique vegetative, educational, scenic or other values.

A natural area could come under provisions of the act through identification by the land board, formal designation by the legislature, the lease of private land or acquisition authorized by the legislature. (Use of condemnation for acquisition is prohibited, except in the case of specific legislative action. Existing eminent domain law is not changed, in this respect.)

The land board and the Department of State Lands would be given responsibility to systematically inventory state lands in search of areas for possible protection. The board would submit its findings to the 1975 legislature, and thereafter would annually report any changes or additions.

The legislature could act on these annual reports, but would not be limited by the board's proposals.

In other words, the board would *identify* areas and give them administrative protection from condemnation or development. The legislature could *designate* them and further insure that protection.

HB 628 also contains a provision for including private land in the natural area system, at the landowner's request. Private land can be leased by the land board for a minimum of 25 years at the rate of a dollar a year. The land board would enforce provisions of the act and could terminate the lease if the landowner was not cooperating. In return, the landowner receives some advantages. His land would receive preferential taxation. Furthermore, his land could not be condemned for any other purposes. His land, or any land in the system, would be protected from condemnation since the bill provides that natural area use is the highest public use of the land. It could not be subjected to lesser uses—such as highways, dams, or strip mines—without specific legislative authorization.

Some individuals think the condemnation protection would be enough incentive to cause half the landowners in the state to clamor to get into the natural areas classification system. On the other hand, others believe that the one dollar a year lease and preferential taxation is not incentive enough to encourage anyone to join. Perhaps we will have to wait a few years, if the proposed legislation is enacted, to more fully understand the appropriate level of incentive. (Of course, a further limiting factor is that the area must be suitable for natural area protection.)

A notable procedural provision in the bill stipulates that the land board must hold at least one public hearing before publishing its comprehensive regulations governing natural areas. This provides an opportunity for the public to become involved in the protection system.

Crucial to success of this legislation is creation of an advisory council composed of citizens well acquainted with natural areas and

continued

their protection. The council would conduct studies and make recommendations to the board. One state which has adopted a similar measure has required the administering agency to act on the advisory council recommendations within 90 days, either adopting the recommendations or clearly citing reasons for denying them.

Although we feel the advisory council is critical, we also recognize that it is contrary to current administration policy to make advisory councils statutory. (Two years ago the Anderson administration cleaned house and eliminated some of the useless 160 statutory boards, bureaus and commissions.) Should it become

necessary to eliminate the statutory advisory council from the bill, a council, created by the administration and composed of qualified citizens to whom the land board would be responsible might serve the purpose.

Montana is fortunate to have more unsullied tracts of state land than perhaps any other state. Hopefully, with measures like HB 628, we can respond to this opportunity by preserving what is left for future generations. 🐾

Rick Applegate is employed by the Northern Rockies Action Group as an environmental researcher. Dorothy Bradley is a Democratic representative to the Montana Legislature from District 11 (Bozeman).—Ed.



EARLY DAYS ON THE MISSOURI RIVER BREAKS

I grew up on a Montana homestead at the foot of Square Butte in the Missouri River Breaks.

One hundred years ago, this stretch of the Missouri River was not as isolated and quiet as it is today. It was the center of a vast industry, the river steamboat era. These flat-bottomed boats had been especially built to navigate the Missouri by sliding over the shifting sand bars.

In 1868, two boys came to the Montana Territory to seek their fortunes. Later, one helped to write the 1889 Montana Constitution and the other became a member of the State Legislature.

After the Civil War devastated their Virginia plantation, the boys looked to the West where fortunes were to be made shipping buffalo hides and other furs to Leningrad and London. Because the beaver hats worn by European men were no longer in vogue and beaver were nearly all trapped, buffalo robes and pickled tongues—a delicacy in eastern and foreign markets—were in great demand.

The brothers left parents and younger sisters and brothers on the plantation, promising to send for them when they could. Maria, their mother, wept silently as her sons left for the wild Northwest Territory.

They traveled from Virginia by train to St. Louis and then by steamboat up the Mississippi and the Missouri Rivers, taking 66 days to travel over 3,000 miles. Civilization had driven the last great herds of buffalo up into Montana and Canada and often the steamboat had to tie

up for two days to allow the herds to cross the river.

Stops were made for cottonwood for fuel, at \$28 per cord. One such fueling place was Cow Island, a sand bar near the mouth of the Judith River. This sand bar was also the scene of steamboat wrecks because the Missouri channel shifts and cuts the jumbo clay banks in a capricious manner.

The boys neared the end of their journey in the fall, as they floated past the prairies and up into the White Cliffs of the Missouri which were highlighted by the reflection of the blue sky. The steamboat chugged past Hole in the Wall, past Coal Cliffs, until it reached Fort Benton, where the mule and oxen teams were waiting for their freight from St. Louis.

The levies at Fort Benton were piled high, on either side of the river for half a mile, with buffalo hides that were to be loaded for downstream transport. Charles found a job loading the robes on the steamers as soon as he landed. William decided to try his luck in the little town of Helena. Within the next eight years, these two boys—the Conrad brothers—made one of the great fortunes in Montana, shipping buffalo robes and later the dried bones to markets.

Gold was shipped down river to market and supplies for the Royal Canadian Mounted Police were brought from St. Louis on the return voyage during the 1870s, using this same route by Coal Cliffs and White Cliffs, stopping to buy wood from the Indians for fuel, dodging the ever shifting sand bars, trusting always in the ability of the river captain to sense his way down river safely.

During the 1880s, buffalo hides were the main cargo, since the buffalo seemed to be an endless commodity and the unsuspecting beasts were easily hunted and slaughtered. Only the robes and some tongues were salvaged, while the huge carcasses were left to rot on the open plains. Buffalo robes at that time brought about 50 cents for calves and from \$1.50 to \$6 for cows and bulls. Each of these sources of revenue for the mountain steamboat business became exhausted after two decades. With the advent of the railroad, the river trade was gone.

Today this is a lonely stretch. No buffalo cross the river; no Indians cut firewood; grazing is sparse for cattle and water is scarce for settlers. Even the prairie dogs and rattlesnakes seem to enjoy companionship as they sometimes share the same holes.

Great pelican flocks stop in their migratory flight to feed here and a jack-rabbit or an antelope can be seen. The wolves are gone because the buffalo was their main source of food. But the Missouri and the beauty remains.

Ora J. Halvorson
Montana State House of
Representatives
District 16
Kalispell, MT

BEST PLANT MATERIAL UNAVAILABLE

For some time, I have been concerned about the almost complete lack of progress in upgrading the suitability of trees and shrubs planted for ornamental, fruit and shelterbelt purposes in Montana.

I believe the private nurseryman generally does not seek out and make available to his customers the best adapted plant material. His tax-subsidized competitors, the State Forest Service, peddle their dubious products through Soil Conservation and Extension Service personnel and have an equally bad—or worse—record.

All this "expertise" is now directed toward reclamation of coal mined areas by planting them with large tracts of green, wooded areas. The appearance of the entire state will be seriously affected, since most of the trees and shrubs planted do not grow, but only plug a hole where better plant selections could add to our environment.

The following are only two examples of the whole irresponsible situation:

(1) Caragana is used about eight times more frequently than buffaloberry. Buffaloberry provides a denser cover and better berries (as a food source) at critical times of food shortage.

(2) Shelterbelts are planted in "cornfield" type rows, up and down hills,

MONTANA NATIONAL PARK ENTRY APPLICATION

Your July/August 1973 Catchall section featured an item on "Montana National Park." I neither sell barbed wire, nor am I ready to submit my check covering the fees for one day of the fresh air treatment. But, I am beginning to think the author of that article may have the right idea.

To assist in development of his project, I have designed an entry application, to be completed and submitted by any and all who wish to enter the great Park. As soon as this form has been approved, please notify me so I can send in my application and take advantage of the earliest possible opportunity to visit the Park.

A copy of the application is enclosed for your inspection.

Lyn Snell
Eden Valley, MN

MONTANA NATIONAL PARK ENTRY APPLICATION		FOR OFFICE USE ONLY
Date Submitted _____		Rec'd. _____
Name _____		Filed _____
Address _____		Micro. No. _____
Nat'l. Ident. No. _____		NatCom Check _____
TelComp No. if different from NID _____		
Reason for Visit (see regulations on reverse for permitted activities, time limitations, area designations, and fees)		Remarks _____
☐ Hunting (specify species _____) Area _____		
☐ Fishing (specify species _____) Area _____		
☐ Hiking Area _____		
☐ Skiing and/or snowshoeing (snowmobiling <u>not</u> permitted) Area _____		Entry Approved by _____
☐ Boating and/or canoeing (motors <u>not</u> permitted) Area _____		Date Approved _____
☐ Swimming Area _____		Activities Approved _____
☐ Photography Area _____		
☐ Painting and/or sketching Area _____		
☐ Pure air treatment (filling of tanks <u>not</u> permitted) Area _____		Entry Gate _____
☐ Other _____ Area _____		Fees Rec'd. _____
Entry gate preferred (see reverse) _____		Code for Applicant _____
Have you visited Montana National Park before? _____		Notification _____
Date of Visit _____	Area of Visit _____	

in many different kinds of soil, over rocky or sandy ridges and in swampy areas with no regard for species suitability. It would be far better to simulate nature and plant the best suited species for a given site.

It seems to me these actions are lacking in common sense and that they disregard basic ecological principles and more current research. The knowledge and plant material is available to do a much better job of shelterbelt planting.

Clayton V. Berg
Helena Valley Nursery
Helena, MT

BIG BUSINESS HAMMERS, CLAMORS

I read the two opposing views on domestic energy in the July/August 1973 issue of MONTANA OUTDOORS and once again concluded that big business is hammering away with its slick propaganda. Business interests have lobbies everywhere, always clamoring on the same constant note—progress. Sure we can have progress, but I think it could be obtained with good conservation sense

and not with this mad rush toward self-destruction.

Is it progress to have our rivers, lakes and countryside befouled by factories and their foul offal? I believe that it would be a good tonic for the people of your state and the states surrounding Montana to see what high pressure progress has done to us in the East. Even those most indifferent to that black cloud on the horizon would change their attitude.

And what right does anyone have to deny *any* generation the enjoyment of pure water, air and unscarred land?

Stanley Popowicz
Quincy, MA

HELP "SMART"

I am enclosing a newsletter called "SMART"—Stop Mining Around Residential Tucson. It explains our problems better than I ever could.

We live in an area where Conoco has staked out mining claims, including a mobile home area of 2,700 people. The surrounding country is some of the most

beautiful desert in Arizona. The Arizona-Sonora Desert Museum is only seven miles away. The Saguaro National Monument is a few miles from the museum and it is considered the finest stand of great saguaro in the United States. These areas have not yet been staked, but I need not explain what a mining operation would do to all of this. I can move my residency, but Conoco could never replace the desert.

Please contact your local and federal legislators and urge them to inform all citizens about outdated mining laws.

We hear Conoco has been buying mineral rights from Montana farmers in not the most ethical manner. From articles in MONTANA OUTDOORS, it sounds like your problems may be just like ours.

Should you wish more information on what we're doing in Tucson, contact John Dore, 5824 West Tumbling F; Tucson, AZ 85713. His information would be more complete and accurate than mine.

Theo. Kincaid
Tucson, AZ

Next Time

Watch for these features in the January/February 1974 MONTANA OUTDOORS

- special emphasis — we're losing our streams!
- Sun River Game Preserve
- ice fishing
- the ptarmigan
- subdivision development



MOUNTAIN SHEEP, A Study in Behavior and Evolution by Valerius Geist, The University of Chicago Press, Chicago, 1971, 383 pages, \$14.50.

This is one of the few full-length books published on mountain sheep. Because of its price and the detailed nature of the text, it is not the type of book most people can relax with after a hard day's work. Probably its greatest appeal is to mountain sheep researchers and others specifically interested in animal behavior and evolution.

Field information on behavior was gathered and reported for three races of mountain sheep. Included were the Stone sheep in the Cassiar Mountains of northern British Columbia, Dall sheep at the Kluane Lake Game Sanctuary in the Yukon and Rocky Mountain bighorn sheep in Banff National Park in southern Alberta. It was interesting to note that the author considered the protected populations in the park and sanctuary to be low quality animals.

The chapters on home ranges and migration, habitat and body care behavior and population dynamics and quality may appeal to a majority of readers since the author presents some basic information on the requirements of mountain sheep.

The book is well illustrated with 89 black and white pictures, 77 tables and 49 figures.

Unfortunately, the author attacks hunting of mountain sheep. His opposition to hunting appears to be based on very little factual data. Persons using his argument for not hunting mountain sheep should consider the author's statement in the preface, "I have not discussed sheep conservation or management." Perhaps these are two things that must be discussed if we are to maintain wild sheep habitat and populations.—*Allen Schallenger*

SHOTS AT MULE DEER by Rollo S. Robinson, Winchester Press, New York, 1970, 209 pages, \$8.95.

Following an impressive introduction in which the author outlines several meritorious objectives—ranging from promoting love and respect for wild animals to defending the right and necessity of sportsmen to harvest surplus wild animals—*Shots at Mule Deer* rapidly becomes little more than another "how to do it" on hunting.

Among the 10 chapters, only the first (a scant 14 pages) is concerned with the biology, habits and management of mule deer. Although possibly sufficient to acquaint the casual reader or mule deer

hunter with the animal, this limited treatment scarcely seems in keeping with either the author's objectives or the wealth of biological and ecological information now available for mule deer on western rangelands.

The remainder of the book presents descriptions and evaluations of equipment used in hunting (chapters 2 and 3), various approaches or strategies for hunting (chapters 4 and 5), mechanics of shooting and tracking wounded animals (chapters 6 and 7), handling and care of the carcass (chapter 8), trophy characteristics and mounting (chapter 9) and use of horses in hunting (chapter 10). These discussions are very complete and may prove helpful to the first-time hunter, especially in the central intermountain west. However, the experienced hunter or the avid reader of outdoor literature will more likely recognize it as little more than a rehash of information and ideas previously published in scores of books and articles on hunting in the western United States.

In general, the text of this book falls far short of its attractive cover and title, adding little but 209 pages of another hunter's views, personal experiences and prejudices to library shelves.—*Richard J. Mackie*

BOOKS RECEIVED —reviewed in brief—

FOOD FOR KNAPSACKERS AND OTHER TRAIL TRAVELERS by Hasse Bunnelle with Winnie Thomas, a Sierra Club Totebook, San Francisco, New York, 1971, 144 pages, plastic-covered, \$1.95.

Good food is important to the success of any trip. Knowing this, several Sierra Club members experimented with practical methods of serving appetizing and well-balanced meals. The ideas developed were tested in Sierra Club summer trips and the resulting recipes and hints are published in this little book. Emphasis is on weight of needed equipment and supplies.

COOKING FOR CAMP AND TRAIL by Hasse Bunnelle with Shirley Sarvis, Sierra Club Totebook, San Francisco, New York, 1972, 198 pages, plastic-covered, \$3.95.

Here are some 200 recipes intended for those who travel—by foot, car or raft. Camper's meals can range from adequate to exotic, but even an adequate meal should be tasty. Emphasis here is on the stomach.

THIRD POLLUTION: The National Problem of Solid Waste Disposal by William E. Small, Praeger Publishers, New York, Washington, London, 1970, 173 pages, \$6.95.

Author William E. Small is a science writer and former staff member of the Senate Public Works Committee. He specializes in the study of solid waste pollution. Small describes the present state of public opinion about America's growing trash problem, how widespread it is and how little is being done.

WHAT'S AHEAD FOR OUR PUBLIC LANDS? by Hamilton K. Pules, compiled for the National Resources Council of America, Washington, D.C., 1970, 342 pages, paperback, no price listed.

This is a summary of the Public Land Law Review Commission's activities and final report. It contains the commission's recommendations for use of some 700 million acres of public lands and laws covering that land. The book was written for members and affiliates of the National Resources Council of America and for the public to aid in understanding issues and problems affecting the nation's public lands. It uses terms the layman can understand.

WILD MUSHROOMS OF THE CENTRAL MIDWEST by Ansel Hartley Stubbs, The University Press of Kansas, Lawrence, 1971, 135 pages, \$6.95.

This book could serve as a guide to mushroom hunters, but I couldn't recommend it. Although it contains some 60 color photos, the color reproduction is not good and many of the photos are fuzzy. I think other books would be of more help to the beginning hunter.

FLY CASTING FROM THE BEGINNING by Jim Green, Sevenstrand Tackle Mfg. Co., Westminster, Calif., 1971, 80 pages, \$2.

This handy little guide begins with a definition of fly fishing and takes the reader through an illustrated "how to" lesson of casting. It helps the beginner choose and match equipment to his fishing area and includes diagrams of proper fly fishing strokes. It even has a section on "How Not to Cast."

KEY TO NORTH AMERICAN WATER-FOWL by Stephen R. Wylie and Stewart S. Furlong, illustrated by Jack R. Schroeder, Livingston Publishing Co., Wynnewood, Penn., 1972, 32 pages, \$2.98.

This book represents a new step in outdoor nature guides. It is printed on opaque plastic instead of paper. This means it is waterproof, washable and durable under field conditions. The book enables the hunter or birdwatcher to easily recognize all species of ducks, geese and swans. The color plates clearly show conspicuous markings and the text provides information on size, weight, flight patterns and food and habitat preferences.

BUCK LAWS

MONTANA'S DEER MANAGEMENT program, like that in other states, receives criticism. Sportsmen question (1) when the season should begin, (2) how long it should last (3) how many deer per hunter and (4) what sex should be hunted.

Early this year, the debate reached a peak in the form of House Bill 62. That proposed legislation, introduced before the 1973 Montana Legislature, would have made the shooting of female deer illegal except in areas designated by the Fish and Game Commission. The bill failed, 79-13.

Even though the Commission already possesses authority to so regulate deer hunting, sportsmen should be concerned that the bill was introduced *at all*. Obviously, its introduction means that some Montanans misunderstand the facts about deer management, especially in the case of "bucks only" seasons.

TRADITIONS

The reasons for this misunderstanding probably go back many years. In medieval times, the taking of the stag, because it had antlers, gave the hunter status—he became a superior hunter. Shooting a buck was (and still is) a status symbol—the reasoning has persisted. But in addition, buck seasons have become synonymous with low deer populations. None of this, however, is based on biological fact or the principles of sound deer management.

The philosophy of killing males only came from the old world. Like other European traditions, this one has endured even though it has nothing to do with deer management or biology. In fact, European game managers now recommend selective harvests of big game herds, including the females and young.

EARLY HUNTING

Throughout the era of deer scarcity in the early 1900s, management measures centered around restricted seasons, enforcement of restrictive laws and limiting the kill to bucks only. This was true not only in Montana, but in other states as well.

As early as 1917, one deer per hunter was the rule during an Oct. 1-Dec. 1 season with most of eastern Montana closed to hunting. This illustrates another common and erroneous concept—that deer were almost exclusively a product of western forests and mountains and that eastern Montana was not really deer country.

In the early 1920s, deer seasons were even more restrictive. Most areas allowed bucks only, and many counties were closed entirely to deer hunting.

In the drought and depression years of the 1930s, people were still concerned about wildlife, in addition to their own economic problems. The results were establishment of many game preserves and a month-long deer hunting season confined to bucks with antlers at least four inches long.

The protectionist attitude prevailed through the 1940s until 1951, when Montana held its first either sex seasons. By 1957, bucks only hunts were nearly a thing of the past, with only 1 of 51 hunting areas so restricted.

SUSTAINED YIELD

Since 1957, Montana hunters have taken around 100,000 deer each year. The point here, though, is that Montana's deer ranges have continued to produce an annual, sustained yield since the more liberal either sex, multiple



F&G photo by Bob Martinka

a giant step backward

by Steve Bayless
and Joe Egan

bag seasons began in the late 50s. This should emphasize the point that Montana's deer herds *are not* overharvested. Rather, they have continued to produce a sustained yield of deer each year in spite of what some people consider "heavy" hunting pressure.

Actually, sportsmen interested in deer need only worry about two major things—too few deer or too little browse. Unfortunately, both of these "worries" depend on each other. Almost invariably, few deer in any given area indicates something is wrong with the deer habitat. Maybe the deer range has received poor

treatment by other land users—poor livestock management, extensive agricultural development, etc. *The same land can't be expected to simultaneously produce a maximum number of deer and maximum production of cows, grain and other commodities.* And, as a complicating factor, the deer themselves may overuse the range.

THE BALANCE

At any rate, too few deer in a place where there used to be many usually indicates a past failure on the part of this department to convince people of the need to hold deer numbers in

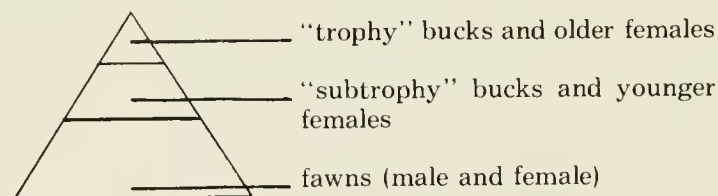
balance with the available forage. The department simply didn't allow enough deer to be harvested to relieve heavy pressure by the deer on their own food. When allowed to continue, this situation usually results in fewer deer, simply because they've overused their range and food plants have not remained as productive.

Animals in balance with their habitat—the key to good deer management and perpetuation of future huntable deer populations. To accomplish this requires either sex hunting seasons, and in some places, multiple bag limits. This approach was

population pyramids

We can view the game population in a specific area such as the Missouri River Breaks as a pyramid. The size of the pyramid (the total population) is dictated by condition of the

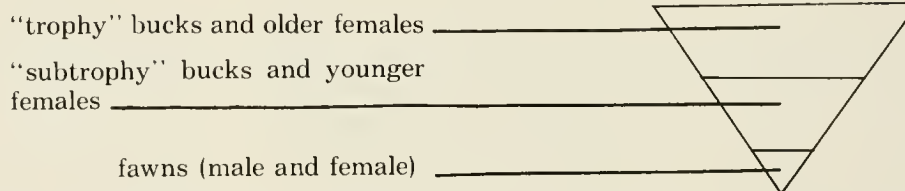
habitat. In a normal population, the age and sex of the animals would make the pyramid look like this:



To have a large population of "trophy" bucks, a *larger* population of "subtrophy" bucks must exist. To have a *larger* population of "subtrophy" bucks, there must be an even larger fawn population. Obviously, every male fawn doesn't

live to be a "trophy" buck, even if there are no hunting seasons.

If everyone wanted to shoot only bucks—and nearly everyone would want a "big" one—the pyramid would have to look like this:



This pyramid is biologically impossible for any length of time. Any animal population—deer, elk, elephant, fish, pheasant or whatever—must contain a substantial number of young-of-the-year.

Since habitat dictates pyramid size (the population) and since all animals (deer included) produce more young than will survive with or without a hunting season, a harvestable crop of fawns, young bucks, young does, "trophy" bucks and older does is present. It is not a "biological sin" to shoot fawns or

does, just as it is not a "biological sin" to catch a 10-inch trout. The "sin" part has to do with tradition.

If it were biologically possible to maintain populations of big trout, "trophy" bucks and cock pheasants without young animals and/or females, this might be desirable. However, since that is not possible—and if the Department of Fish and Game is to maintain a sound wildlife management program—some harvest of does and fawns must continue.—
Joe Egan

used over most of the state. But unfortunately, some deer ranges are still going downhill, because the department failed to "get on top of the situation" in time.

To revert back to the "way it used to be" in the "good old days" would mean disaster in the long run for Montana deer. Why? Because a buck season would practically insure an increase in deer beyond the habitat's capacity to support them.

Those who reason that a buck season benefits deer fail to understand that the female segment *eats* just like the bucks. The buck segment, at best, comprises only about one-third of the total deer population. So, a bucks only season means that two-thirds or more of the deer are illegal game. But this two-thirds goes on eating, and eventually overuses the food supply. In addition, under a buck law, illegal killing of does is common and overshooting of prime bucks frequent.

BOOM OR BUST?

With a restrictive season like the buck law, the door is open for a catastrophe like the Kaibab in northern Arizona, or what happened in California's Jawbone area, or the Murderer Creek area in Oregon. In these places, deer numbers increased far beyond what the habitat (the food) could support, and the deer population crashed—deer starved because there simply wasn't enough food. But even worse, after the crash, total numbers of deer were considerably less because there were "too many for too long." A

range that sustains heavy foraging pressure (remember, does eat just like bucks) for years doesn't come back overnight.

In the long run, what really suffers when a buck law replaces sound deer management? First, the deer suffer because there are too many. Second, the sportsman suffers because his chance of bagging a deer becomes slimmer under a buck law. But most important, the deer habitat itself suffers from the pressure of too many mouths to feed. It would be much better to chance overshooting of deer than overpopulation, undernourishment and destructive browsing. The comeback from overshooting can be rapid, but overbrowsing sets the range's productivity back for years.

THE SOLUTION

The solution to the deer problem lies in long-range planning and constant, hard-headed evaluation. Deer management policies have never been static and they never will be. They must change as conditions change. And don't forget about other uses of the land—all have a place, but if one use begins to dominate, other users, like the deer, suffer.

To sum up department thinking on the buck law, an earlier proponent of sound deer management, Ernest Swift, put it quite well when he said, "The road to hell is paved with good intentions, and in dealing with a problem which has remained a controversy over several decades, truth sometimes becomes one of the first casualties."

Don't let this happen in Montana. Always insist on deer management designed to benefit the life-giving habitat first—which will, in turn, benefit the deer. 🐻



both deer
and sportsmen
suffer under
buck law
management

ABOUT THE AUTHORS

Steve Bayless, chief of the department's information bureau, and Joe Egan, assistant administrator of the department's game management division, have been deeply involved in deer management policies for many years. Both hold master of science degrees in game management.



THIS YEAR, TRY ...

A NATURAL CHRISTMAS

STORY BY KAY MORTON PHOTOS BY CRAIG SHARPE

ON THE FIRST Christmas, or so legend goes, the trees of the earth burst into blossom with a promise of new life. Out of the East, guided by the light of a star, three kings came bearing rare and expensive gifts.

Each year we recreate the legends. We deck our halls with aromatic boughs. We load down a cut evergreen with glass baubles and tinsel strands and top it with a make-believe angel. We spend countless afternoons trudging through masses of people and bell-ringing Santas to find shiny, store-bought gifts. We tangle ourselves in a kaleidoscope of ribbons and red and green wrapping paper. And we spend several days and many dollars sending foil-bright cards to an ever-growing list of "friends."

This year, make it different—try a *natural* Christmas.

Untangle yourself from the ribbons and wrapping paper. Use old comic sections from Sunday newspapers as wrapping paper. (In urban areas, where recycled newspapers must be de-inked, you shouldn't recycle comics anyhow.) Make simple drawstring bags from scraps of material and place gifts in them. The bags can be used later as shopping bags. Or, wrap gifts in colorful bandannas or fabric napkins and give two gifts at once.

Make gifts from things you already have or from items that might otherwise be discarded. A little imagination and some paint can turn cardboard cartons into dollhouses. Give friends a jar of huckleberry jam or elderberry syrup that you made yourself last summer. Flavor a bottle of good vinegar with a sprig of fresh basil, dill or tarragon from your herb garden. Look for unusual bottles in which

to put the vinegar. Dried herbs are a welcome gift for anyone on your gift list who likes to cook. (As an extra touch, include a favorite recipe using that particular herb.) Bring back pleasant memories to a grandmother by presenting her with a pomander ball which will give her closet a delightful citrus-clove smell for a long time. (Illustrated instructions are on page 19.)

ALL THOSE CARDS

Last year, Americans sent millions of Christmas cards to each other. In Helena alone, from Dec. 1-Dec. 24, more than 624,000 pieces of first-class mail were sent. Almost 640,000 first-class pieces were incoming. More volume is expected this year. The Post Office urges that all Christmas greetings intended for recipients in the continental United States be on their way by Dec. 15. Think of the energy that hundreds of trucks, planes and buses require to transport those Christmas cards sent each year. Think of the acres of trees required to make the paper for the cards and envelopes. What can you do? A logical first step is to cut down the list of persons to whom you send Christmas cards. It probably isn't necessary to include nearby friends and neighbors because you'll see them many times during the holidays anyhow. Give them your greetings personally.

You might try making your own cards. Fashion them so the card forms its own envelope.

You're probably thinking that even homemade cards use paper. But, a company exists which uses only 100 per cent recycled paper for its Christmas cards. On the back of each card the following is printed—"This card is printed on 100 per cent recycled paper, made



Pomander ball—pierce orange with skewer. String wire through, bending in half. Leave loop at top. Push cloves firmly into orange. Top with a festive bow.



Card Tree—cut four pieces of yarn into varying lengths. Tie random knots and add wooden beads at each knot. Tie the four pieces onto an embroidery hoop. Cut pictures from old cards, mount and glue back-to-back with yarn in between.

continued

entirely from reclaimed waste materials. No trees were destroyed to make this card." Since people probably won't stop sending cards, the founders of "Christmas Cards for the Ecology-Concerned" thought they might as well make the custom ecologically sound. The cards are simple and the buyer has a choice of 18 designs. They are printed on roughly textured 5- by 7-inch off-white paper. They sell for about \$3.75 for a box of 25 and are available at many department stores across the country—B. Altman in New York, John Wanamaker in Philadelphia, Julius Garfinckel in Washington, Marshall Field in Chicago and Dayton's in Minneapolis.

You're no doubt thinking to yourself, "Okay, so I'm attempting to practice ecology by cutting down my list or making my own cards, but what about the 150 I receive each year?"

Use them for gift tags, thank-you notes for Christmas gifts or place cards for holiday parties—cut out attractive illustrations or figures and paste them to light cardboard backing. Or, divide cards into categories—

dogs, cats, flora, birds—and give them to friends who do découpage. You could make an appealing holiday decoration that uses pieces of yarn, construction paper, glue, a few wooden beads and an embroidery hoop. (Illustrated instructions are on page 19.)

THE TREE

The Christmas tree is a big part of the holiday celebration in the United States. It probably arrived with German settlers in Pennsylvania as early as 1746. But, in 1746 a permit wasn't required to cut down a tree on public land. Also, the early settlers didn't have the option of selecting a tree from a tree farm where manicured trees grow in disciplined rows in what surely must be one of the most sterile of land uses.

But today, it *does* cause a momentary pang as you look at a beautifully decorated spruce and realize that in another week it will lie lifeless, beside someone's garbage can. It doesn't have to be that way.

Try a living tree this Christmas. The White House

plans to. For the first time, trees will not be cut down and shipped to Washington for Yuletide festivities. Instead, a blue spruce from Pennsylvania will be transplanted to the White House lawn as a permanent, living symbol.

The best place to shop for your living tree is a nursery near your home. The nurseryman will be aware of any special climatic demands. According to Bill Mills, manager of the State Nursery in Helena, Colorado blue spruce are the best trees for in-ground planting in cold, northern climates. Small spruce may be permanently potted—for use on an apartment or patio terrace.

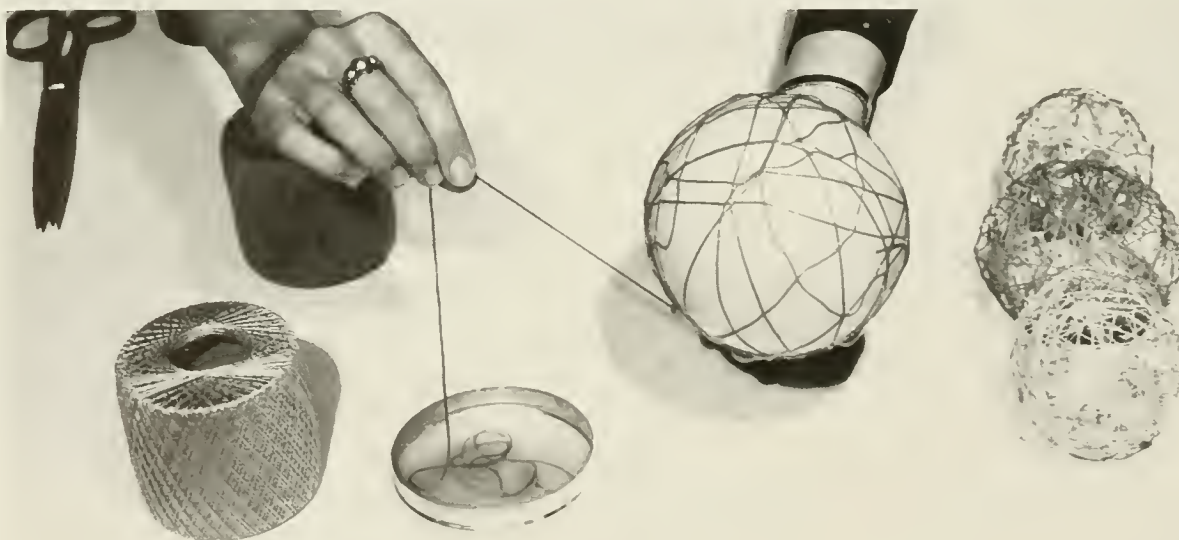
First of all, if you do live in the north, dig a hole for the tree *before* the ground freezes. Fill the hole with straw, compost and topsoil. Cover everything with straw to keep freezing to a minimum.

Most likely, the tree you buy will either already be in its container or it will be balled and burlapped. If you pot a balled and burlapped tree, be sure to remove any ties around the neck of the

MAKING THREAD BALLS

You'll need balloons, string or thread and liquid starch. (We used crochet thread in red and metallic silver and gold.) Place some liquid starch in a small container. Put several feet of thread into the starch, making sure it is

thoroughly moistened. Wind the thread around an inflated balloon until you like the results. Dry the string ball overnight, pop the balloon and remove it. Hang with the same color of thread from your tree's branches.



tree. Also, cut away the burlap at the top and give the ball a long, thorough soaking. Do *not* fertilize the tree until it is planted outside. The tree is in a dormant state and should be allowed to remain so, Mills said.

Keep the *entire* ball of earth intact around the roots and make sure it is well moistened at all times. Conifers are sensitive to drying out and few will survive one short period of severe dryness.

The less time your tree stays indoors in a warm room, the better its chances for living. With plenty of water and a moderate indoor temperature, a tree should be able to stand 7-10 days inside.

No, matter how festive it looks, don't put your tree in that cozy corner by the fireplace. Keep it away from heat ducts and hot drafts. Put a tub, dishpan or child's "flying saucer" under the pot and keep an inch or two of water in the bottom at all times.

After your tree has served its indoor purpose, remove it to a cool, but not freezing, area. Mills suggested an unheated porch or garage. On the first mild day, plant it in the ground where it will grow permanently. Plant as you would any tree—being careful to keep the soil around the roots intact—tamping in soil mixed with moistened peat moss, if possible. Flood with warm water. If mild weather prevails, flood the tree with warm water in about two weeks. If the weather becomes colder, leave the tree alone.

Mills said late February was the earliest date recommended for moving a spruce outside.

If your tree is going to be a terrace decoration, buy a small tree and keep it in a cool place until severe winter weather ends. If the winter temperatures in your area do not dip below 15°F., the tree may be placed on the outdoor terrace or patio immediately. Give it protection from chilling winds and the burning sun that can occur on bright winter days.

Living trees aren't cheap. Mills estimates a blue spruce will cost about \$5 per foot. He believes

that's about average for domestic, nursery-grown trees. Cut trees aren't that much cheaper—from \$2-\$3 per foot.

You might also consider an artificial tree. They come in a wide variety of sizes and colors and many of the artificial evergreens look like real trees. They have the added advantages of requiring no feeding or watering and they can be dismantled, stored and used next year.

TRIMMING THE TREE

Regardless of what kind of tree you choose, the whole family can have great fun decorating it. Popcorn and cranberry strings are still with us. Some people dip their cranberries in melted paraffin before stringing, but that probably isn't necessary if they only have to last 7-10 days. However, the wax does give the berries a "shine." To string popcorn, pop it at least two days before you start stringing. Leave it uncovered (and, of course, unbuttered) and you'll find it is much softer and easier to work with. To string, use a small needle with a big eye so you can use reasonably strong thread. You can also create mixed garlands by combining the cranberries and popcorn.

Another idea for garlands is macaroni. String elbow macaroni, end to end, in opposite directions. It makes an interesting chain and you can use it again next year. If you want added color, dip the macaroni in colorful paint.

Other decorations might include pine cones, decorated cookies hung with a ribbon or artwork your children bring home from school during the Christmas season. The children might enjoy using scraps of thread to make thread balls, a simple process requiring only colored thread or yarn, liquid starch, string and balloons (Illustrated instructions are on page 20.)

A FEW MORE IDEAS

- In the excitement and haste, don't forget a Christmas tree for birds. Popcorn and cran-

berry strings, suet, nuts, seeds, grain and bread scraps are greatly appreciated winter treats.

- You don't have to cut boughs to make a wreath. Pine cones, acorns, twigs, corn husks, various kinds of nuts and just about any "weed" make an attractive wreath. One simple idea is to tie a sheaf of headed wheat with a brightly colored ribbon.

- Take your family ice skating.

- Find a farmer with an old-fashioned sleigh and a couple of strong horses.

- Try a winter picnic with hot chili and enjoy the silence and sights that often escape us in the summer.

- Build a snow animal.

- Use oranges, plums, apples and other fruits to make a centerpiece "tree." Accent it with peppermint sticks.

- Fill your kitchen with the smells of things your mother or grandmother used to make—gingerbread, fruit cakes, marshmallow fudge, divinity.

A real Christmas doesn't shine because of electronic displays of lights or flashy holiday slogans. A real Christmas isn't heard on a busy street in the middle of holiday shoppers jostling each other. A real Christmas doesn't mean mounds of glittering, expensively wrapped presents nestled under an elaborately (and artificially) decorated tree. It doesn't happen because 250 cards came in the mail.

It comes through taking a moment in the midst of all the hurrying to watch snow silently falling outside a window. It comes from making hot chocolate for cold, red-cheeked children. It comes from using bits and pieces of natural things around you to weave a holiday spirit.

You may end up with a few squashed cranberries on the kitchen floor and pieces of yarn, string and old greeting cards scattered throughout your house. But you'll know you've given a real Christmas—a natural Christmas—to those around you. 🐾

THE PRONGHORN ANTELOPE

*center of a complex interrelationship
between man, wildlife and land*

by carl coffman

MONTANA IS RICHLY endowed with a variety of natural resources. However, the state now faces intensive exploitation from native and outside interests that threatens these natural resources—especially our abundance of wildlife. Again and again man has proved himself insensitive to the environment's complexity. His negligence threatens his own future and the very existence of wildlife. The antelope of Montana's wide expanse of prairies serve as an important example of this complex interrelationship between man, wildlife and land.

The history of antelope resembles the history of most Montana game animals. When the pioneers moved to Montana with dreams of a land of milk and honey, the introduction of farming and ranching drastically shifted the delicately balanced prairie environment. Many places where large herds of antelope once roamed were put to the production of food, fiber and meat. As domestic livestock replaced wildlife and plows turned native rangelands into agricultural monocultures, antelope numbers began to decline. Without its native

habitat, the pronghorn could not compete. By the 1920s, antelope were scarce in Montana.

The great depression turned dreams into a harsh reality of overcrowded, overused and inhospitable land. Homesteaders, lured west by the promise of unlimited resources, went broke by the thousands. As pioneers left, the broken sod and overused rangelands began to heal.

Vegetation needed by antelope started growing again. In fact, native "weeds" and sagebrush often became more abundant than in prehomestead days. There was again a livable environment for antelope.

In the late 1930s and early '40s, the Montana Department of Fish and Game developed successful antelope trapping and transplanting techniques. The reintroduction of antelope into their former range was thus assisted and greatly accelerated. But the regrowth of native vegetation provided the real "key" to antelope survival.

For the last decade, Montana's antelope population has remained fairly stable. Fluctuations in





numbers, caused by weather extremes and range conditions, occur locally. But, as long as the basic requirements of antelope are met, the pronghorn will thrive.

To improve and modernize antelope management, the department began cooperative studies with the University system in the mid-1950s. In the mid-'60s, the department started a long-term cooperative study with the Bureau of Land Management on sagebrush ecology. The studies have provided valuable information for use by wildlife managers. Constantly being updated, this information forms the basis for Montana antelope management today—management which strives to maintain the all-important habitat.

UNIQUE INHABITANT

The pronghorn antelope, a unique inhabitant of Montana's prairies, has distinguishing characteristics which make it the only game animal of its kind in the world. Antelope have horns like domestic cattle and the true African antelope. But, unlike either of them, the American pronghorn

In general, antelope fare well during spring, summer and fall. However, when deep winter descends on the Montana prairie, life can become a struggle. Without essential sagebrush, that struggle is often a losing battle. Antelope buck (right), photo by Jon Cates. Snow scene, F&G photo by Harley Yeager

sheds its horn sheath annually. Therefore, it isn't a true antelope. The horn resembles the hollow horns of sheep and goats. Composed of hair materials, it is physically like the horn of the rhino. Both buck and doe antelope have horns, although the buck's are usually much larger.

The coat consists of hollow hairs which provide insulation from winter cold. Males have a dark throat patch; females do not. Either sex, when disturbed, raise the long white hairs of the rump patch. This signal is visible for miles. A scent is also given off, which warns the herd of impending danger. In addition, antelope emit a highpitched whistling sound which provides additional warning.

The pronghorn is curious, but wary. Its superior eyesight (about equal to a man with seven-

continued

power binoculars), agility and the ability to achieve speeds of 40 miles per hour or more all combine to make the pronghorn a truly unique animal.

FOOD HABITS

Montana antelope studies provide information about food habits and behavior. Research reveals a close relationship between pronghorns and the sagebrush-grassland community which covers much of eastern Montana.

In spring, antelope eat green forbs—the flowering plants or “weeds” of the prairie. Some sprouting green grass may also appear in their diet for a short time. Antelope browse sage in spring, but as summer approaches, the forbs or “range weeds” are preferred.

Fringed sagebrush, cudweed sagewort, yellow sweetclover and various wild members of the alfalfa family are the preferred summer foods. These plants occur naturally in the sagebrush-grassland community.

In some places, antelope may also eat agricultural crops such as alfalfa. This happens during the desiccation, or drying up, of natural foods, and before sagebrush becomes important as a food. In general, on lands not overgrazed by livestock, antelope do well during spring, summer and fall.

But the Montana winter—often severe and punishing—is sometimes a different story. During these cold months antelope depend almost totally on sagebrush for food. In one Montana study, big sage, fringed sage and silver sage formed 98 per cent of the antelope winter diet. Big sage was by far the most important of the three plants. Although antelope exist in many Montana areas which have

little or no sagebrush, they generally move to a sage covered area to winter. During severe winters—a time of great stress for the pronghorn—sagebrush and antelope are inseparable.

SOCIAL BEHAVIOR

Large herds formed in winter break up in the spring. Does isolate themselves to have their fawns. Bucks set up territories which they defend from intrusion by other bucks until after the fall breeding season. This territorial behavior is a common trait of most animals, to one degree or another. After the does bear their young, the antelope population in a given area consists of three distinct segments, which remain intact until fall—(1) does and fawns band together, (2) bucks continue to maintain territories, upon which they attempt to hold females and fawns and (3) bucks unable to establish and maintain territories gather into bachelor herds.

As the September rutting season approaches, territorial males intensify efforts to hold does on their territories for breeding. During this period, intruding bucks face threats and possible combat from the territorial bucks. Early studies disclosed that a buck's territory encompassed approximately one square mile, but that only certain places met the requirements for establishment of such a territory. When the rut ends in October, the social groups disband and mix to form larger herds, which may then move to winter ranges.

Over the years, many Montana antelope have been trapped, tagged and released. Some have been equipped with radios. These sophisticated techniques enable researchers to keep track of the animals on their home range. During winter, fawns use a home range of around 2,000 acres. Adults range over about 3,000 acres and yearlings, up to 4,000 acres. (Yearlings of all wild species tend to wander further than other age groups.) Recent information indicates that, in summer, territorial bucks defend an area of about 1,000 acres. Female/fawn groups use an area about three times as large and bachelor herds use the largest area—over 4,000 acres.

MANAGEMENT

In the last decade, antelope studies have been intensified to improve management. But in addition, more information on antelope life history is needed since large-scale range manipulations and poor range management seriously threaten antelope habitat, and subsequently, antelope survival. Besides vast areas of federal land, Montana has five million acres of state land, much of which is prime antelope range. Managers who design programs to eradicate sagebrush on public land theorize that increased forage for domestic livestock will result. But arbitrarily altering rangelands on a massive scale has frequently failed to produce anticipated miracles. What this practice *has* accomplished is removal of antelope habitat, not to mention habitat for other animals dependent on the sagebrush environment. Depriving antelope and other wildlife of sagebrush, especially big sage and other

ANTELOPE FILM COMING

The environment and information division's film center will soon complete a 25-minute movie on Montana antelope. The documentary, *A Chance To Be*, elaborates on the antelope life style and elicits intelligent action to maintain Montana's abundant antelope habitat against a variety of threats.

Carl Coffman, who is primarily responsible for editing and completing the film, wrote this article which is similar to the film script. However, the original script resulted from much department-supported field research, by a variety of people, which has continued since the mid-1950s. Many department employes helped with the script and took much of the original film footage.

Coffman expects the film to be out early in 1974. Like all department films, this one is available free of charge to schools, sportsman's clubs and other organizations.

associated plants, leaves them with insufficient food. When winter comes, the result for antelope can sometimes be disaster.

Winters with bitter cold and heavy snowfall put the greatest stress on antelope. Through use of radio tracking devices, it was found that antelope herds migrate to the same winter areas year after year. All of these wintering areas have enough sagebrush to carry the pronghorns through until spring. Little movement from the winter range occurs until herds break up in the spring.

Recent studies have increased knowledge of pronghorn habits and habitat requirements. Essentially, the same picture exists as did in the 1950s and '60s. The same strong relationship between antelope and the sagebrush-grassland community prevails. Adequate winter range is still an integral part of that relationship.

ANTELOPE INVADING TOWNS

From time to time in the deep of winter, antelope in Montana's northern counties have made headlines by invading towns. Along the Milk River, between Havre and Glasgow, antelope winter range is marginal. Sagebrush is seriously lacking, and deep snow and cold weather at times cause a mass movement of several thousand resident and Canadian antelope into the area. Havoc results. Townspeople try to protect ornamental shrubs. Ranchers try to keep antelope away from haystacks. Hundreds of pronghorns starve, and many are killed by trains and vehicles. All of this destruction occurs because there is not enough winter food—not enough sagebrush. Even more important, though, too many antelope damage what little sage there is.

The problem is chronic, occurring at least seven times in the last twenty-five years. And it's compounded by involvement of an international herd. Many of these antelope spend most of their time in Canada until severe weather and deep snow drive them south.

The winter of 1964-65 was the most severe on record in northern Montana. In places, snow reached 40 inches in depth. The wind blew constantly. At Glasgow, below zero temperatures were recorded for 78 consecutive days. Five hundred antelope died of starvation. Cars and trains killed several hundred more as the antelope traveled and rested on plowed roads and railroad tracks.

Examination of carcasses near Glasgow revealed that 97 per cent were in advanced stages of malnutrition. Old bucks, weakened by rigors of the breeding season, were more prone to starvation than other adult antelope. Fawns, of course, suffered greatly and many died. Stomachs from dead antelope revealed a general lack of life-giving sagebrush. Creeping juniper and other "starvation" foods formed the bulk of the diet.

On winter range near Malta, the weather and antelope situation was the same as at Glasgow,

except that big sage was plentiful. In this area, antelope losses were minor. This stretch of sagebrush—a mile wide and 15 miles long—brought 4,000-5,000 antelope through the winter. Even though this is the northern extent of big sagebrush in the United States, the Malta winter range provides excellent antelope habitat. But it will not sustain the pressure of several thousand wintering antelope indefinitely.

Aerial surveys in the Havre-Glasgow area in the summer of 1965 revealed the extent of the winter toll. A 62 per cent decrease in Montana pronghorns and a 38 per cent decrease in Saskatchewan antelope was observed. In addition, the Glasgow and Saskatchewan herds experienced poor reproduction following the severe winter on poor range. However, antelope associated with the Malta winter range, where good forage conditions existed, experienced good reproduction.

THE CHALLENGE

To reduce or eliminate winter losses and agricultural depredations, hunter harvest quotas must match antelope numbers to the quality and quantity of available winter range. Also, crucial existing sage must be preserved. If Montana's antelope are to survive at present or higher levels, it will take more work and the cooperation of many people and agencies. Programs to increase knowledge of antelope seasonal movements, habitat requirements and general characteristics must continue. Cooperative studies must provide more facts for better management. But most important, antelope habitat must remain just that: habitat unaltered by man's questionable quest for short-term benefits.

The natural state of Montana's prairies provides valuable lessons for agriculture and ranching. Overuse will only deteriorate presently productive areas and needlessly expand poor practices, disrupting natural prairie beauty and wildlife habitat. Better land management practices which recognize antelope and other wildlife as a necessary part of the picture will be a big step in the right direction. Halting habitat destruction and enhancing winter ranges is necessary. It will take everyone's wisdom and care to maintain a free, healthy habitat for antelope.

It is becoming more and more evident that man's ability to progress, possibly to survive, is to a large degree determined by sensitivity to his natural environment. The complexity and interrelationships of nature have time and again been disrupted by man, supposedly for rational reasons but often indicative of complacency, immediate profit or lack of knowledge. From the interdependency of wildlife and nature, man may learn basic principles and practices that provide a healthy life for all.

Antelope are an integral part of Montana's natural scene. If we cannot recognize the right of antelope to exist—their chance to be—we endanger our own chances for life, peace and harmony. 🐾



By
Dr. W. Leslie
Pengelly

CLEARCUTTING

TODAY, MANY WRITERS in and out of the wildlife profession are asking serious questions about the adverse consequences of logging on other forest values, including wildlife. The benefits from timber production are, for the most part, taken for granted while the harmful aspects are often ignored.

What do we really know about forests and wildlife and human needs? Stephen Spurr, in his book *Forest Ecology*¹, describes the forest as "...a complex of organisms, both plant and animal, mutually occupying a complex of environments."

As Spurr notes, "...wild animals are an integral part of forested ecosystems." They don't infest the forest; they live there. They are an important component, perhaps far more important than we realize.

MULTIPLE-USE

On public forests with multiple-use objectives, we should have even less cause for debate. In a paper appearing recently in the *Journal of Forestry*, titled "Ecological Framework for Deer Management,"² Henry Short states exactly that. "...Deer numbers and productivity generally vary inversely with the forest manager's ability to direct energy into...[trees]. On multiple-use forests, however, the objective is to maximize society's benefits from the recognized uses. On these lands deer are entitled to that share of the 'energy pie' which results in

greatest public benefit....Thus, management techniques that increase quality as well as quantity of available forage, eg., prescribed burning and fertilization, are of special importance."

Before discussing benefits and failures of various management practices, perhaps one point should be made. Logging activity *will change* the conditions for many species of wildlife—sometimes for the better and sometimes for the worse. It cannot remain the same. So managers must learn the site's potential for both plants and animals. And they must consider public needs before implementing management objectives. Benefits to wildlife should be included in advance plans, not achieved accidentally. Unfortunately, most wildlife benefits achieved from public land management to date have indeed been accidental, not purposeful. And now these resource agencies are ready for a change.

Judging by the ratio of wildlifers to foresters in public employ, wildlife interests have neither been dominant nor even very important partners in multiple-use management. In the Washington office of the U.S. Forest Service, for example, the chief of the division of wildlife management is one grade lower on the pay scale than are his colleagues representing other disciplines.

HABITAT DIVERSITY

Now, that some hints at the answer have been given, let's return to the question—what do we really know about forests, wildlife and people?

This article was adapted from a speech given by Dr. Pengelly at the annual conference of the Soil Conservation Society of America in Portland, Oregon (August 1972).



F&G photo by Eldon Smith

AND WILDLIFE

Wildlife benefits should be planned, not achieved accidentally.

Wildlife ecologists view the forest as a spectrum of niches or unique habitat combinations that fulfill the needs of resident wildlife. Generally, diversity and abundance of animals in a given unit of forest are directly related to habitat diversity and abundance at that time.

Topography, site and tree mortality and gradients of moisture, wind, snow depth and temperature create these diverse ecological niches. The plant succession that follows after fire, insect kill, windthrow, and more recently, logging, will determine the kinds (diversity) and numbers (abundance) of animals in that particular forested area. The animals which are affected by these changes can themselves change the plant community. Or, in short, everything is connected to everything else.

The natural diversity of forests can be radically altered by fire suppression, logging, roading and planting. Partial cutting may increase "forest edge" animals and species able to tolerate man's activities and smaller units of habitat. However, some larger ungulates and carnivores can't tolerate man's intrusions, and they disappear.

Clearcutting causes more radical alterations because it generally involves large blocks of land, extensive roading, and regeneration activities including slash burning, tree planting and control of weeds, shrubs and animals that damage the forest reproduction. With the current management emphasis on decreasing site disturbance, new logging

systems with reduced roading may obviate some of these problems.

LIMITING FACTORS

What does clearing, burning, roading and planting do for wildlife? Almost all claims about the wildlife (i.e., game animals) benefits which follow clearcut logging make one basic assumption—that food is the limiting factor. Unfortunately, this is not always the case. Wildlife workers are often puzzled by the absence of deer and elk in areas with obvious surpluses of forage. In other areas, deer and elk persist long after the forage supplies appear depleted. Confronted with this question, Michigan deer researchers concluded they had either underestimated the animal's ability to select and survive or they had underestimated ability of the site to produce nutritious forage.

Studies of elk in coastal forests were initiated following build-ups in population on recently logged areas, which in turn affected young Douglas-fir seedlings. These studies,³ conducted in southwestern Oregon on an industrial forest, showed a decided increase in elk observed feeding on the logged and burned study area. Numbers peaked within five years and by the twelfth year the number had declined to that observed the year following the cut. The study also showed the elk were reluctant to venture very far from cover.

This raises more questions about clearcuts. Are more animals reported only because they are more readily visible? Are they the same animals

continued

that formerly lived unobserved in the vicinity? Or, has the increased forage produced an increase in animal numbers?

Perhaps the weakest area in game management is in relating forage productivity and other conditions to animal productivity. Where food is lacking in quantity and/or quality, it is safe to assume that new and improved forage supplies should produce more and healthier animals. Where food is not the limiting factor, forage production may cause loss of cover and freedom from harassment, which would be harmful to wildlife.

Recent studies of radio-collared elk in areas being logged allows observers to record habitat types selected by elk. Hopefully, this research will answer some of the questions posed by managers, hunters and the general citizenry about the impact of logging and roading on wildlife populations.

As mentioned previously, a behavioral trait may limit an animal before food shortages do. White-tailed deer, for example, frequently select cover in preference to food. And animals trapped and transplanted to better forage areas have frequently beaten the truck back to the trapping site. Habit is hard to overcome, and animals normally seek out physical surroundings familiar to them.

The animal's physical limits may also be exceeded. Deer are said to be under stress when snow depths exceed 20 inches (height to brisket). Elk are under stress if snow is more than 30 inches deep. During periods of deep snow they often attempt to move to a more favorable location. White-tailed deer seldom migrate and their numbers are frequently reduced during extended deep snow periods. Elk and mule deer will migrate, but heavy winter losses have occurred in several western states in recent history.

THE FOREST CANOPY

When logging removes the tree canopy, many profound ecological changes follow. Competition for moisture is decreased, sunlight penetrates to the forest floor and often encourages a rapid invasion by shrubs, forbs and grasses. This sequence can be altered by the amount of site disturbance during logging (roading, dozer piling, tree-length skidding, balloon logging) and after logging (slash burning, fertilization, planting, fencing).

Lee Eddleman, range ecologist at the University of Montana School of Forestry, noted this and wrote, "A three- to five-year period is usually necessary for grasses and other native plants to become reestablished on mechanically disturbed areas. More than twice as much time is needed for reestablishment on intensely burned areas. From the standpoint of the native understory species, light soil disturbance and light burns, such as are associated with broadcast burning, are desirable."⁴

Subsequent field work convinced Eddleman that he underestimated the amount of time needed for reestablishment on severely burned sites. This

has great significance for wildlife in areas where slash is piled and burned and in areas where fire suppression over long periods of time creates fuel build-ups leading to potentially disastrous wildfires.

In addition to fire-related problems, removal of tree canopy by logging noticeably increases snow depths. On Dec. 31, 1971, measurements taken by this writer in clearcuts on the North Fork of the Coeur d'Alene River, Idaho, showed 36 inches of heavy, wet snow. In adjacent mature stands of hemlock, cedar and grand fir, snow depths were approximately eight inches. The large clearcuts of 1956-57 were burned in 1958 and replanted to Douglas-fir and western white pine. The slopes were broadcast burned and have since revegetated with a massive stand of evergreen ceanothus, 8-10 feet tall, and lesser amounts of other shrub species. Early wet snows discourage travel by even the hardier and bigger elk, especially if forage is available elsewhere with less effort and less exposure.

White-tailed deer winter along the rivers as they have for decades. Only now, valuable riparian vegetation has been destroyed by subdividing and road widening. And river bottoms are being used more and more by snowmobilers who often harass already stressed wintering game.

SIZE AND LOCATION IMPORTANT

Recently, clearcuts have been too large to be of much value to wildlife. Continual activity in a drainage, with new clearcuts placed adjacent to earlier cuts not effectively revegetated, is poor forestry and poor wildlife management. The question arises whether allowable cuts should be spread over the entire forest or taken out of one drainage in a short period of time. Many cuts at high elevations provide no winter range for wildlife and may remove summer range. Cuts on north slopes may eliminate fall sanctuary without providing forage.

Other adverse effects of clearcutting on wildlife include construction of "barriers" of endless windrows of logs and stumps. Road construction on steep slopes frequently creates nearly vertical cut banks on the uphill slope and impassable walls of debris on the downhill side. These barriers should be broken in the draws and ridge points to allow unimpeded animal movement up or down the slope. Recent management directives have been aimed at cleaning up these barriers completely.

Clearcut margins are commonly thinned after logging. Slash is often left where it falls, creating barriers and fire hazards.

Downhill dozing of logging debris to form walls along creeks may keep silt out of the stream, but it cannot qualify as a good management practice. At the same time, it destroys the freedom of animals to move about.

WIND AND WILDLIFE

Wind velocities in large openings created by logging have measurably increased over nearby

uncut stands. It is not known what effect this has on wildlife, but it probably is detrimental. Wind velocities were measured in white spruce stands west of Hinton, Alberta in mid-January 1972 with a portable anemometer. Three locations were measured—mature spruce stands, mixed brush and scattered trees on old cut-over areas, and new clearcuts. The average velocity was less than 1 mile per hour in the timber, 12 mph in the brush and 29 mph in the clearings. The wind drifted the snow in some areas and cleared it away in others. If given a choice, however, foraging animals will not suffer from exposure to chilling winds in areas where they are also exposed to the view of man and predators.

A clearcut may create a highly variable trend along a moisture gradient ranging from heavy forage production on wetter sites to very light production on drier sites. But increased moisture from deep winter snows on clearcuts is rapidly lost by early spring melt because of increased insolation. This pushes peak run-off ahead in the spring and also advances the summer drought period. Increased wind velocities in spring and summer dry out the sites. These conditions are of minor consequence with limited logging, but when thousands of acres in a watershed are cut, the results could be far more serious.

A 40-acre clearcut in a coastal forest might be beneficial to deer and elk for a brief period. Additional cuttings, well spaced over time and area could add to animal welfare. But a similarly sized cut in isolated stands of Douglas-fir in the Lima Peaks of southwestern Montana might be harmful, especially since browse regeneration on drier sites is usually poor. If the browse species are not present, no amount of cutting and burning will produce them. Also, in this area, animals need forest cover, as poor as it may be, for concealment and shelter.

If success in rehabilitating game ranges by logging varies along a moisture gradient, then perhaps estimates could be made for intermediate conditions. Work from 1949-64 on the Coeur d'Alene National Forest tends to confirm this hypothesis.⁵ Browse response to cuttings was somewhat slower than in coastal forests, but it lasted longer—30-50 years, compared to less than 10 years in Oregon. Understanding the process is more difficult on wetter sites on the Coeur d'Alene

Forest because moisture is in the form of snow, which buries low forage and hampers animal movement. On very dry sites, patches of timber are more valuable as cover than they are as potential forage after logging. Foresters are discovering that it is not good silviculture, either, to log on poor sites.

ROAD SYSTEMS

Ten to twenty years ago many state game agencies encouraged foresters to build extensive road systems because they were helpful in achieving adequate game harvest in inaccessible areas. This demand followed on the heels of game build-ups, range damage and die-offs in many areas. The job of selling increased harvests worked too well in some areas, however, and the management goal was switched to reducing harvest. Now several fish and game agencies in western states actively oppose additional roads. Game harvests achieved in long, either-sex seasons with postseason extensions are mostly gone now. In some areas, timber production can be achieved only at the expense of quality recreational hunting. Federal land management agencies can no longer ignore the threat to quality hunting, unsightly landscapes and a decline in hunter ethics that accompany excessive roading.

Extensive road systems provide an opportunity for illegal killing of wildlife and game law enforcement officers frequently are frustrated in attempts to protect wildlife in such areas. William Sigler explains this in his book, *Wildlife Law Enforcement*, by noting a willful violation of wildlife law is often an opportunity to do so.⁶

Even legal game is sometimes threatened in areas made accessible by new roads. Isolated goat herds near the north end of the Bob Marshall Wilderness were threatened by legal and illegal pressures following recent road building activities in an adjacent area.

SLASH DISPOSAL

After logging, various systems of slash disposal are employed to cut down hazards of fire, disease and insects, and to prepare the site for regeneration. Slash disposal by fire frequently benefits wildlife by increasing germination of seeds of browse species buried in the duff and stimulation of sprouting in general. It also removes the physical barriers of heavy volumes of slash which facilitates animal movements.

MONOCULTURES

Ecologists are also concerned with the trend toward simplification of ecosystems that seems to characterize modern land management, whether it be for corn or trees. Monocultures may be easier to plant, weed, harvest and market, but they are seldom stable.

Stability is usually associated with diversity. Western forests have naturally diverse topography and composition, but attempts have been made to overcome this and to produce single species, even-aged stands in large blocks. Such forests are

continued

ABOUT THE AUTHOR



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more vulnerable to disease and insect damage and are of reduced value to wildlife. Hopefully, the trend now is toward mixed species and smaller units. In the south, harvesting of hardwoods followed by the planting of pine species has aroused the wrath of fish and game commissions who foresee declines in deer, turkey and squirrel populations as the mast forage (such as acorns, chestnuts and beechnuts) and denning trees disappear.

Tree monocultures lead to animal monocultures with disastrous results. Following logging and slash burning on moist sites, a rapid invasion of grasses and herbaceous plants often makes ideal habitat for white-footed deer mice, meadow voles, ground squirrels, mountain beaver and later for deer, elk and black bear. The rapid build-up of animals in response to improved vegetal conditions creates problems of another kind—animal damage. Seed consumption, damage to seedlings and girdling of trees can be excessive. So, costly animal control programs, utilizing poisons, repellents, traps and fencing are often instituted.

THE FIGHT IS ON

Forest managers who select a site, log it and then attempt to revegetate it are also setting up its destruction. Wildlife is no longer considered an asset, and it is attacked. On the West Coast, deer are "pests." Bears are trapped and shot. Thus, the public becomes polarized against timber interests, and the fight is on. State game departments are drawn into the act and must attempt to devise programs to handle these situations. But often state wildlife employees can do little to influence the course of events.

Forest managers try to get the forests back into production as soon as possible after logging. This makes good sense economically, but it defeats the purpose of multiple-use management. If foresters take credit for helping wildlife by removing trees, burning slash and providing access roads, why are they in such a hurry to replant the area? Why doze the site to reduce competition? Why fence, spray, trap, fertilize and replant?

Natural regeneration may take more time, but it lasts longer and in later stages, it generally produces high numbers of game species such as deer and elk.

SUMMARY AND RECOMMENDATIONS

In summary, *some* clearcut logging benefits *some* species of wildlife in *some* areas *some* of the time. Research is still incomplete, but we are aware of the complexities, and we are attempting to unravel them.

Animals adapt, move or die, if their environment is altered radically. They have evolved over many centuries and cannot adapt successfully to sudden changes. In turn, wildlife doesn't have unrestricted opportunities to move elsewhere.

Logging that (1) exposes game to harassment and death, (2) scarifies the site to reduce grass, forb and shrub competition and (3) is immediately

followed by tree planting, fencing and animal control programs is hardly beneficial to wildlife.

The amount of land permanently subtracted from production by roads, landings and piles of logging debris, presents an extreme challenge to the land manager. This steady erosion of the land base negates any gains derived from improved management procedures. Individual cuts and multiple cuts of variable sizes within drainages have a cumulative effect which appears to reduce many of the earlier advantages claimed for clearcutting.

Intensive forest management is seldom compatible with wildlife interests. Goals and priorities, based on public needs, should be established for each area long before intensive timber harvest begins.

I have purposely not mentioned aesthetics in relation to clearcutting for several reasons, none of which should indicate a lack of concern on the part of wildlifers. Clearcutting seriously affects aesthetics, no doubt. But a discussion of aesthetics deserves more space than I have here.

Value judgments color each of our views. On this point, Aldo Leopold said, "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends [to do] otherwise." Perhaps if we apply these concepts of land ethics to techniques of land management we can truly achieve a more stable and rewarding existence. 

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what all parents should know when their children ask for a gun

by Mel Wojcik

He asked you once and you told him you didn't think he was old enough. But now Christmas is just around the corner and you know what he would like to find under the tree—his own rifle. Still, you hesitate. This is a big decision and one that should be carefully considered. Some of the most frequently asked questions and their answers may help you in making that decision.

Q. When is a youngster ready for a gun?

A. A youngster in a family of avid shooters and hunters might be ready for a gun at a very early age—maybe even eight or nine. Don't say "yes" just because your son or daughter pleads with you. Another might not be ready until he or she is 14 or 15. The only measure possible is the individual's responsibility. Ask *yourself* if you can trust him or her with a gun. Or, does the youngster require constant supervision? Let him prove to you he is ready to have a firearm and willing to accept all responsibilities connected with it.

Q. Am I ready for my youngster to have a gun?

A. Again, you must ask *yourself* some very important questions and then answer them



illustration by Vern Craig

truthfully. You can't expect to buy your son a firearm, hand it to him and then send him out on his own. You must spend hours *with* him—teaching him the proper way to handle a gun in the field, proper care of the firearm, proper methods of sighting in and many other rules of safe gun handling. Are you able to spend this extra time with your son or daughter? If not, maybe there is a grandfather

or uncle or some other mature adult who can take the time.

If you cannot somehow spend the time with your youngster, you should definitely hesitate to buy him a firearm. However, if you can and if you believe the youngster is ready to own a firearm, then start looking for a suitable gun.

Q. What type of gun is best?

continued

A. This varies with one's interests. A rule of thumb to use when purchasing a firearm for a youngster is to make sure it is *simple* and that it *fits* the individual. A single shot, bolt action .22 rifle is often best suited for the beginner. And it's relatively inexpensive. Other parents select BB, CO₂ and pneumatic air guns to teach their youngsters the fundamentals of shooting. *Never* take the attitude that these firearms are "only a BB gun" or "just a .22." These guns deserve the same respect given the big game rifle or shotgun.

A youngster 12 years old has a lot of growing to do, so the firearm should be small and light enough for easy handling. A gun too large or heavy often causes problems in practicing safe gun handling and may deter the youngster's interest in shooting. When purchasing a youngster's first firearm, explain your needs to the salesman, so he can help.

Q. Where can your child shoot?

A. Montana still has some wide-open spaces. If a shooting range isn't available, find a rock-free hill which makes an ideal backstop. If you plan to use private land, acquire permission from the landowner first.

An indoor range in the basement of your home can be easily constructed with a slanted steel plate and a sandbox. This eliminates travel, and you can practice in any type of weather, any time of day.

Q. Should the youngster have the hunter safety course before getting a gun?

A. Yes. Montana law requires that juveniles (under 18 years of age) must satisfactorily complete the Montana hunter safety course before purchasing a resident hunting license. And, nonresident juveniles must complete a similar course in any state or province before purchasing a nonresident license.

Shooters or plinkers do not have to take the course. But even if the youngster does not plan to *hunt*, he should complete the

course before he receives his first firearm.

Q. What subjects are covered in the hunter safety course?

A. Primarily, the hunter safety course exposes the student to basic fundamentals of safe gun handling. This includes studying different types of guns and their actions, ammunition and safety in the field, basic principles of game management, survival and first aid, game identification, landowner/sportsman relations and game laws. However, this course is only an introduction. The parent or guardian must continue to help the youngster develop safe gun handling habits.

Q. At what age should I allow my son or daughter to take a gun out in the field alone?

A. First, one must comply with the state law which prohibits children under 14 from carrying or using "any firearm of any description, loaded with powder and lead, in public, except when such child is in the company of the parent or guardian or under the supervision of a qualified firearms safety instructor."

Secondly, a look at the hunting accident record for juveniles last year might make the answer easier. Of the 26 hunting accidents recorded in Montana during the 1972-73 license year, 9 involved youngsters under 18 years of age. Of these 9, 2 were 17,

2 were 16, 3 were 15, 1 was 14 and 1 was 13. Although this is a relatively small sample from which to draw conclusions, note that only 1 youngster 13 was involved in a hunting accident. Of the nine juveniles involved in accidents, six definitely were not hunting with adults. Information on the other three does not indicate if the youngster was hunting with friends his age or with an adult. So, it seems that between the ages of 14-17, when youngsters can legally carry firearms by themselves, they might be a little careless, and foolish accidents *could* result, especially if they are out with friends their own age.

As a general rule, be sure your youngster is mature enough and has developed proper safety habits before you permit him to go afield alone. 🐾

ABOUT THE AUTHOR



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MOVING?

If you're planning to move in the near future, please fill out this blank and send it to MONTANA OUTDOORS, Fish and Game Department, Helena, Montana 59601.

FORMER ADDRESS:

name
address
city state zip

NEW ADDRESS:

name
address
city state zip

THE CATCHALL

feeding wintering wildlife

Like many controversies, a mixture of misunderstanding, personal feeling and at times even personal profit clouds the real facts behind the artificial feeding of wildlife.

Interest in assisting wintering wildlife with supplemental feeding began as early as 1900. Since then, game management workers have experimented extensively with artificial feeding of deer, elk and antelope.

The Montana Department of Fish and Game policies on supplemental feeding of big game animals are based on study and experience in Montana and on similar experiments and operations in other states. Although situations involving antelope, deer and moose have also cropped up, most artificial feeding advocates are usually concerned with elk.

If there is a valid time to

feed elk, it occurs when an area does not have enough natural forage available to the number of animals wintering there. This occurs (1) if the hunter harvest fails to reduce an elk population to a level compatible with existing winter forage, or (2) when normally acceptable numbers of animals are faced with unusually extreme wintering conditions which reduce the availability of forage below the usual level. In the first situation, feeding would allow more animals to winter in an area than the natural range could support. In the second case, feeding is simply an attempt to maintain a base population in the face of unusual, extreme or even normal winter conditions.

Artificial feeding seems to be a simple solution to inadequate winter forage. However, some drastic "trade-offs" are involved. These trade-offs show up soon after an intensive feeding program begins. And, they affect both the

continued



illustration by Vern Craig

elk and their habitat. The magnitude of these effects is directly related to the intensity and frequency of an artificial feeding program.

Artificial feeding always causes elk to depart from their normal behavior. Normally, elk remain scattered in and adjacent to timber cover during daylight hours and move out in the openings to feed in the evening, night and early morning. When artificially fed, they tend to domesticate and lose the desire to rustle for natural food. They concentrate on the feeding grounds during midday, either eating or waiting for the handout to arrive. Unnatural concentration, although nice for taking pictures and viewing, results in severe social strife between different age classes of elk. The calves take the brunt of the adversity because of their size.

Concentration also increases

SPRINGBOARD

"Native prairie is a base line from which creative research can depart. To destroy the last of the native prairie would be as criminally stupid as burning history books, for prairie is a chronicle of human courage, endurance, and victory, as well as a finished natural system."—*John Madson, Winchester-Western*

"The real issue is keeping our multiple-use forest program in balance. Currently, we are stressing timber production over all the other [uses]. We are out of balance now."—*John R. McGuire, chief of the U.S. Forest Service, USDA, (quoted by the New York Times News Service)*

FOR DISCUSSION

the opportunity for spread of disease and parasites. For example, brucellosis, a dreaded livestock disease, is almost nonexistent in natural ranging elk populations, but common in populations which habitually winter on artificial feeding grounds.

Probably the most important drawback of an artificial feeding program is that it concentrates elk earlier and to a greater degree on the portion of the range which is critically important during the most severe winter weather. Even though enough artificial feed is supplied to the elk, they still hunger for natural foods. In fact, "hay-fed" elk use preferred and nonpreferred food plants just as heavily as they do when they are suffering severely from malnutrition. Willow shoots, spruce needles, pine needles and stems, aspen bark and any other available plant is consumed. Ultimately, this depletes forage. So, when elk are artificially fed on a sustained basis, the final result is the nearly permanent loss of the area's natural capacity to carry elk during the severe portion of winter. This, in turn, increases the elk's dependency on handouts.

Even under the most experienced standard, artificially fed elk do not do as well as those which winter on sufficient natural range. Free ranging elk are healthier and more productive than those on established feeding grounds.

An elk feeding program is very costly and you don't get the maximum return—in benefits to elk—for dollars spent. Feeding elk requires a constant yearly drain of game management funds with absolutely no carry-over benefits for coming years. In other words, feeding must be done every year or the whole herd becomes jeopardized. By using the same money to purchase game ranges—traditional elk wintering areas—permanent carry-over is provided and it's a sound investment. Once game ranges are purchased, they continue to support elk naturally. The only cost is boundary fence maintenance (in lieu of tax payments) and minimal improve-

ments. Game ranges also provide habitat for wildlife other than elk, and access to adjoining public land. So, a valid and important reason exists to spend money for game ranges rather than on hay feeding. It is much better for the elk.

Some people believe feeding is a better alternative than hunting seasons, particularly late seasons. However, wildlife population levels must ultimately be regulated. If this is not done by hunting, nature will do it through starvation and reduced reproduction. When nature handles the situation, elk are lost and the capacity of the land to sustain elk is drastically reduced.

Considering these facts, the department strongly feels that feeding elk regularly is not in the best interest of elk populations. We prefer the alternatives—(1) balancing population levels with natural range capacities and (2) acquiring additional winter habitat not already in public ownership.

It will always be the department's intent to take the management action which benefits the wildlife resource the most. If we did any less, we would not be doing our job.—*John Cada* 

OUTDOOR RECREATION SURVEY RESULTS

The department's recreation and parks division recently finished an extensive survey of outdoor recreation use in Montana. Tabulation of the returns (on a statewide basis) produced some interesting findings, such as:

—Of those using Montana recreation areas, 59.1 per cent used a camper or travel trailer for sleeping, 22.8 per cent used tents, slept under the stars or other means and 18.1 per cent were daytime users only.

—Of the various outdoor recreations "participated in," survey respondents spent the most time driving for pleasure. Other activities were ranked as follows (in order): walking for pleasure, sightseeing, fishing, playing outdoor games, touring back country with four-wheel drive vehicles,

picnicking, hunting, bicycling and camping. (The ranking represents the total number of times those surveyed participated in a given activity. Thus, while more persons participated in walking than fishing, fishing may be the most popular for many individuals. For example, in fall, more individuals would be participating in hunting and it would rate higher on the scale.)

—The outdoor recreation “preferences” (what people would rather do) differed somewhat, however. They rank like this: driving for pleasure, fishing, walking for pleasure, sightseeing, hunting, touring with four-wheel drive vehicles, camping, picnicking, motor bike riding and horseback riding.

—Of the Montanans surveyed, 27 per cent preferred “natural undeveloped environment areas”; 22.4 per cent “general outdoor recreation areas” (developed camping, picnicking, boating facilities, etc); 15.5 per cent “outstanding natural areas” (Glacier Park, Lewis and Clark Caverns, etc.); 15.4 per cent “primitive areas”; 12.6 per cent “historic and cultural sites,” and 7.1 per cent “intensively developed recreation areas.”

—Statewide, 60 per cent of recreation area users were Montanans. However, in the region around Flathead Lake and the west side of Glacier Park, 75.1 per cent were nonresidents.

—The majority of users classed the environmental factors (space, natural beauty, access, privacy, etc.) and facilities (tables, fireplaces, toilets, etc.) as “good” or “excellent.”

(A more comprehensive report is available from the recreation and parks division, Department of Fish and Game; Helena, MT 59601. A report of survey results will soon be published in the Statewide Comprehensive Outdoor Recreation Plan, combining data from relevant federal and state agencies and local governments and providing guidelines and standards for public recreational areas. The study is ongoing.) 🐾

DRY FIELDS, DEAD STREAMS

Everyone talks about the weather, especially when there's a continuing hot, dry semidrought like last summer.

Farmers talked a lot about scorched grain, hay shortages and lack of irrigation water. Ranchers complained about bone dry stock ponds. City dwellers suffered through water restrictions. And, fire fighters endured explosive, tinderlike forest conditions.

Sportsmen, too, did some

talking about the weather. However, they were concerned with more than growing commercial commodities. If they were stream fishermen, they probably were a little bit ill (and mad) when they saw their favorite waterway go dry.

One of many such examples occurred just north of Helena. Here, a rancher diverted the entire flow of Little Prickly Pear Creek

continued



Two scenes of Little Prickly Pear Creek, north of Helena, after the entire stream was diverted onto a hayfield. F&G photos by Tom Warren

THE CATCHALL

onto his hayfield. Below the diversion about one-half mile of stream bed went dry—and died. The dusty channel contained hundreds—maybe thousands—of game and nongame fish. Some were three-pound brown trout which could have provided some angler with a fair catch.

And, along with the fish and the water, all other aquatic life disappeared. Under the sunbaked rocks were decaying remains of various types of aquatic invertebrates—primary fish foods.

When the water returned, the fish and other aquatic life also began to return. Nature has an uncanny knack of rapidly filling voids in her system with the best adapted life form for that specific niche.

But fish managers estimate it takes at least two, and perhaps three, years to bring a dewatered stream back to "normal productivity." During that time, sportsmen better hope Montana doesn't have another dry year.

Last summer, Little Prickly Pear Creek was only one example of a statewide problem. There were other examples, mostly smaller streams, but some major rivers were also affected. Some, like the Bitterroot, were little more than wet in some areas.

How can Montanans who now have very little voice in preventing stream destruction do something to keep water in the state's streams? The upcoming legislature will be asking the same question. Hopefully they will have strong support in their efforts to curb the destruction of Montana's waterways.

But regardless of the sure-to-come legislative action on the stream preservation issue, watch for a more detailed account of this topic in the next issue of MO.

ESTIMATING YOUR DEER'S TRUE WEIGHT

To keep the meat from spoiling, hunters always remove the viscera immediately after the kill. But when deer or elk is hanging in the garage or basement, the sportsman often wonders how much it weighed. He can weigh the hog-dressed carcass (only the viscera removed—head, feet and skin still present) with little trouble, but how does he determine the true live weight of his prize?

Although not exact to the pound, he can come fairly close by simply figuring that the viscera averaged about one-third of the total live weight. Or in other words, if the animal tipped the scales at 150 pounds hog-dressed, its live weight was close to 225 pounds.

If the viscera, head, feet and skin were all removed, the hunter can roughly estimate the live weight by figuring that these parts totaled about one-half of the live weight. Or, in other words, if

a dressed animal weighs 150 pounds (without the viscera, head, feet or skin), its live weight was close to 300 pounds.

FROM BOOM TO BUST

"Is the snowmobile boom turning into a bust? The magazine, *SPORTS ILLUSTRATED*, reports that 'six years ago there were 100 companies making snowmobiles in North America; last year there were 60, now there are 40 and insiders predict half of these will be gone in a few years.' The stock of Canada's largest manufacturer, Bombardier Ltd., has dropped from \$25 a share to \$7, partly because of profit problems caused by the costs of meeting new safety and noise regulations. Meanwhile, the Michigan Department of Natural Resources zoned 16 state parks and recreation areas for 'silent' use—hiking, cross-country skiing, snowshoeing, birdwatching. All off-road vehicles are banned." —reprinted from AUDUBON

WIND SCORPIONS

Every summer about a dozen persons appear at the department's reception desk, gingerly holding tightly capped jars. It is a safe bet that at least half the jars imprison wind scorpions, belligerent little insects. Like their close relatives, spiders, wind scorpions have eight legs. However, counting legs can be misleading because wind scor-

pions have two large, leg-like mouth parts which are used as feelers. Most noticeable characteristics are the large, light brown abdomen and formidable pincer jaws.

Wind scorpions are predators. They are not poisonous but can bite hard with the strong pincers. They move about at night and hide beneath objects during daylight.—Vern Craig



F&G photo by Vern Craig

THE HUNTER'S BAG



Normally, the hunter's bag means the game the sportsman downs with his gun or bow. But this year, Montana hunters have a new "bag"--thanks to a cooperative effort of Montana Stockgrower's Association and the Department of Fish and Game.

Both organizations recognize the potential threat to public hunting created by careless littering. Each year some landowners and sportsmen curse the few who thoughtlessly toss their litter. Even though only a few actually litter, it only takes one bit of unwanted garbage

to spoil it for many future sportsmen.

So we hope these litter bags will help spread the word about the consequences of littering and reduce the amount of trash in the fields and forests this season. ("Litter" is, incidentally, only a nice word for "trash.")

The large, 13- x 24-inch bags are made of heavy plastic and equipped with a drawstring—just right to tote along on your next hunt. Get yours at any Department of Fish and Game office or checking station. 🐾

MONTANA OUTDOORS INDEX

The following is a complete list of articles published in MONTANA OUTDOORS during 1973. Extra copies of most issues are available by writing MONTANA OUTDOORS, Department of Fish and Game; Helena, MT 59601. Price—50¢ per magazine.—*Ed.*

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*To wintering wildlife—the majestic bull elk—Montana often means a constant search for digestible foods.
Photo by Gus Wolfe*

**THE
COVER
STORY**

montana's many faces

Has anyone ever asked you to describe Montana? If so, we bet it was very difficult. Montana offers diversity everywhere—from Glacier's arduous peaks to the scenic eastern breaks, from mighty grizzlies to plump prairie dogs, from colorful mountain trout to ancient paddlefish, from 100-mile backpack trips to scenic walks on backyard acres and from white-water crescendos to sluggish, flatland waterways. Yes, indeed, your state has many faces—many more, in fact, than we can feature here. We will, however, try to make your next description easier by pointing out some things that make the Montana we all know.—*Ed.*

The horse changed the entire way of life for the free-roaming Indian tribes. And today, it's still a popular Montanan. Photo by S. McCune

Montana probably offers a more varied and bountiful game menu than any other state. Photo by Jack Jones



To the historian, Montana presents a vast treasure chest of unrevealed wealth, an unopened book to the American past. F&G photo by Dick Ellis



montana's many faces



A cold, crisp, clear winter day may be Montana's brightest moment. Oddly, fewer eyes feast on it than during warmer—and often less inviting—stages. F&G photo by Eldon Smith



montana's many faces



*Beckoning mountains sometimes lure Montanans to strenuous heights. "Why do men climb mountains?"—a question often asked, but seldom answered.
F&G photo by Bill Schneider*

Montana, the Treasure State, indeed has many wealths, not the least of which is a special place for all wild things—from butterflies to bull elk. F&G photo



Fences—old and new—now divide most of Montana's wide-open spaces. But the bigness of the big sky is, nevertheless, everywhere evident. F&G photo by Lee Huyser



Montana still has free-roaming grizzlies, so it still has large tracts of unaltered wilderness. Wilderness can live without grizzlies, but grizzlies can't live without wilderness. F&G photo by Lloyd Casagrande





On a moment's notice the icy freeze of deep winter can blanket Montana with harsh solitude. F&G photo by Robert Rothweiler

Water, mountains and the quality outdoor recreation they provide—always a big part of the Montana way. F&G photo by Craig Sharpe

montana's many faces



Although sometimes physically demanding, backpacking is becoming more popular every year, perhaps because it allows one to escape the noises, restraints and pressures of everyday life. F&G photo by Bill Schneider



